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THE ASSOCIATION AND HEALTH INSURANCE

ANNOUNCEMENT OF POLICY

A SPECIAL meeting of the Council of the Association was held in Ottawa on January 18-19, 1943, to consider and define the position of the Association with regard to the question of Health Insurance.

The nature of the problems involved in any national plan of Health Insurance in Canada had been for nearly ten years the object of unremitting study by our Association, and there was reasonable assurance that these efforts had produced amongst our profession a grasp of the main elements at least of the subject.

Further; responsible Governmental bodies had kept us fully informed of their special attention to the subject. These departmental studies had now reached a stage of tentative planning towards the introduction of legislative measures with respect to Health Insurance.

It was felt therefore that the time had arrived when the Association should make a definite statement of its attitude towards Health Insurance in Canada, and with this in view the following resolution was brought before the Council in plenary session.

RESOLUTION *Re* HEALTH INSURANCE

WHEREAS the objects of the Canadian Medical Association are:

1. ***The promotion of health and the prevention of disease;***
2. ***The improvement of health services;***
3. ***The performance of such other lawful things as are incidental or conducive to the welfare of the public;***

WHEREAS the Canadian Medical Association is keenly conscious of the desirability of providing adequate health services to all the people of Canada;

WHEREAS the Canadian Medical Association has for many years been studying plans for the securing of such health services;

THEREFORE be it resolved that:

1. ***The Canadian Medical Association approves the adoption of the principle of health insurance;***
2. ***The Canadian Medical Association favours a plan of health insurance which will secure the development and provision of the highest standard of health services, preventive and curative, if such plan be fair both to the insured and to all those rendering the services.***

The resolution was unanimously adopted.

At the moment, it need only be added that the Council showed complete realization of the important decision with which it was faced, and that this unanimous expression of its policy was only reached after prolonged and sober discussion. There was an excellent representation of delegates from every Province; indeed, there has been no occasion in our history on which the representation of the medical profession throughout Canada has been better. It was impressive evidence of the earnest and resolute spirit in which our profession is facing its obligations and upholding its standards.

THE INCIDENCE OF CATARRHAL JAUNDICE COMPARED WITH JAUNDICE FOLLOWING ARSENOTHERAPY FOR SYPHILIS

BY LIEUT.-COLONEL H. S. MITCHELL, M.D., R.C.A.M.C.

SO-CALLED catarrhal jaundice, or infectious hepatitis, is not a notifiable disease in England, therefore its incidence in the general civil population cannot be determined.

In the Canadian Army in England in the period reviewed—July 1, 1941, to June 30, 1942—all soldiers exhibiting jaundice were hospitalized. Thus the incidence of this symptom is easily computed. It had been observed that a considerable number of the patients with jaundice were syphilitic, undergoing arsenotherapy, a number quite disproportionate in respect to the proportion of syphilitics in relation to the personnel strength.

Post-arsphenamine jaundice has been the subject of a great deal of discussion since, and from slightly prior to the end of the war of 1914-1918. Ruge[1] showed that the rise in post-arsphenamine jaundice in the German Navy 1910-1929, closely paralleled a rise in catarrhal jaundice in non-syphilitics. On the other hand, in Johns Hopkins Hospital the incidence of jaundice in syphilitics under treatment was eight times as great as in non-syphilitics. In our study we have not had a large enough number of non-syphilitic patients under arsenotherapy for non-syphilitic disease, to warrant comparison with the syphilitic group, but our observations lead us to slightly different conclusions from either of those just quoted.

The syphilitic soldiers were under treatment, by bismuth and arsphenamine or mapharsen, chiefly for primary or secondary manifestations, with a small number of asymptomatic latent cases. Routine Wassermann reactions or Kahn tests were not done on all the jaundiced patients. It is possible that there were unrecognized cases of syphilis in the non-arsenically treated group; but it could have been only an insignificant number, as the men were young; any case with a history suggestive of venereal disease was serologically tested, and the system in vogue for the detection of symptoms of the acute stages of venereal disease in the Canadian Army is quite good.

THE TYPE OF HEPATITIS

The clinical severity of the hepatitis encountered in this study was, broadly speaking, mild. It was an occasional occurrence that the first intimation a man had of his jaundice was when his friends told him his eyes or skin were becoming yellow. There was one notable instance of an outbreak in a small detachment of one unit, where a high proportion of the personnel was affected. Otherwise, the occurrence of cases was so erratic that case-to-case contact could not readily be demonstrated. Those hospitalized were not isolated. The incidence of jaundice was not any higher in the personnel of static hospitals where the jaundiced patients were treated than in the general army.

There were no features which helped to differentiate the hepatitis occurring in arsenically treated syphilitics from hepatitis in non-syphilitics not receiving arsenotherapy. There was no noticeable substantial difference in the mode of onset, severity of prodromal symptoms, duration of illness, febrile reaction, depth of jaundice, alteration in size of liver or spleen, degree of diminution of bile in the stool, or in the differential or total white cell count of the peripheral blood. We were unable to confirm Lerman's[3] observation that in the arsenically treated there was a slight leucocytosis with normal differential count, as opposed to leukopenia and lymphocytosis in the non-treated group. In the arsenically-treated group jaundice developed at quite irregular intervals, at anywhere from a few days after the first arsenical injection to over a year after beginning treatment. The point at which jaundice appeared during the treatment did not differ in any way from that in other series published, *i.e.*, there were a few immediately after institution of treatment but the majority occurred later in the course.

Microscopical examination of tissue obtained by liver biopsy, in a small number of each group, disclosed a pronounced similarity of lesion, without differentiating features; also, biopsy sections of the syphilitic group did not show the histological picture seen in livers of arsenically poisoned animals. Further, our pres-

ent state of complete ignorance of the etiological agent renders the differentiation of uncomplicated (pure) post-arsphenamine jaundice from infectious hepatitis impossible. Even the use of a presumptive test, such as the Paul Bunnell reaction in infectious mononucleosis, where the infective agent is also unknown, is not available.

During the year reviewed 0.16% of the total army personnel presenting the symptom of jaundice were hospitalized, excluding all types of obstructive jaundice due to cholelithiasis or carcinoma; and hæmolytic or toxic jaundice from any other cause. Of this total group 17.8% were syphilitics receiving arsenotherapy; the remainder were non-syphilitics and presumably suffering only from uncomplicated infectious hepatitis. It is obvious that this is a high incidence of jaundice in the syphilitic group, as 5.84% of all syphilitic patients receiving arsenotherapy during the period developed clinical jaundice; or, the incidence of clinical jaundice in the syphilitic and arsenically treated group was 36.5 times as high as in the non-arsenically treated group.

The drug used in about 90% of our cases was neoarsphenamine. Jaundice was 3 times as frequent in this group as in the smaller group of about 10% treated with mapharsen only. The incidence of 4 (estimated) cases of jaundice per thousand injections is also arresting, a figure approximately 3 times as high as that reported by the Co-operative Clinical Group, for neoarsphenamine.

Complications

The incidence of serious complications in the two groups is of interest. Naturally, when one sees in microscopic sections of liver obtained by biopsy widespread perilobular cellular infiltration and other changes, one is uncertain about the eventual histological structure of the organ. Regarding immediate complications, one of the non-syphilitic group progressed to the clinical state of cirrhosis with ascites, a small number of others, after prolonged (2 to 3 months) deep jaundice with acholic stools, clinically recovered. One expected a greater number of serious complications in the syphilitic group, especially acute yellow atrophy. Actually, in the period reviewed the deaths from that cause were 1.47% in this group. In the non-arsenically treated group, the deaths were 0.95%. All deaths in each group were due to acute yellow atrophy. There was a small number who died with jaundice in uræmia and with degenerative hepatitis. The exact nature of the disease in these cases was not known; it was considered to be due to an unrecognized intoxication or infection, and no evidence of any chemical poisoning was found. If these men be considered to have been really suffering from the same disease (infectious hepatitis) the mortality in the two groups is about equal.

Morbidity

The question arises as to why there is a greater morbidity of jaundice — and we are speaking now of jaundice as a symptom only — in syphilitics under arsenotherapy. That the cause is not syphilitic we believe is reasonably certain from the fact that the jaundice frequently occurred late during the treatment, when the disease could reasonably be considered well under control. That the cause does not lie solely in the special sensitivity of the liver to arsphenamine seems certain from the fact that the men resumed routine arsenotherapy after the lapse of a few months with only one recurrence. (It must be mentioned that this man died of acute yellow atrophy of the liver. He is not included as a death in this series, as he died after the period reviewed. It is suggested that recurrence of jaundice after resumption of treatment may be especially ominous). On the other hand, jaundice recurred in at least one of the non-syphilitic group and is a recognized occasional event in infectious hepatitis.

What then is the cause? First, it is important to refer to the observation that antisyphilitic therapy of itself may cause transitory disturbance of liver function[4] in syphilitic subjects in whom liver function is normal prior to therapy; and, secondly, that arsenotherapy may further depress liver function in instances where the liver function is already depressed; thirdly, the quantitative effect of arsenic may be of importance as mentioned by Curtis,[5] who states that where the dosage of arsphenamine was increased from 7.5 to 13 grm. in 13 weeks, the incidence of jaundice rose from 7-8% to 25-30%. His figures are however somewhat vitiated by the absence of the incidence of jaundice in non-treated non-syphilitics covering the same period. Fourthly, epidemiological observations[6, 7] indicate that there are probably a number of individuals who suffer an infection, mild and possibly sub-clinical or even asymptomatic, due to the agent of

infectious hepatitis, without developing jaundice. The quantitative relationship of arsenic may also partly explain the lower incidence of jaundice in patients treated with mapharsen as compared with neoarsphenamine.

During the period reviewed infectious hepatitis was endemic, and in some communities epidemic, not only in the Canadian Army in England but in the civil population with whom they mingled. The following suggestions are put forward: first, that there are a larger number of cases of infectious hepatitis without jaundice than has hitherto been recognized; and, secondly, as others have considered,[8] that it is the association of two hepatotoxic agents, the arsenic and the agent or toxin of infectious hepatitis, which produces a higher incidence of infectious hepatitis in patients under arsenotherapy. This latter point can only be argued by analogy, which is of course not very satisfactory. Some well-known comparable examples exist, as for instance the effect of exposure or debility upon the predisposition to pneumonia; or the predisposing effect of silicosis towards pulmonary tuberculosis. Thus, arsenotherapy may not only facilitate the development of jaundice in one who would otherwise suffer a benign illness without jaundice, but may also promote the development of infectious hepatitis in some who would otherwise escape the disease altogether.

Grateful acknowledgment is made to Dr. John McMichael, of the London Post-Graduate School of Medicine, for advice and assistance, especially with reference to the histological studies.

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THE ACTIVITIES OF THE R.C.N. MEDICAL RESEARCH UNIT*

BY SURG. COMDR. C. H. BEST AND SURG. LIEUT. COMDR. D. Y. SOLANDT, R.C.N.V.R.

Toronto

THE scope of R.C.N. naval medical research work has been greatly extended since the last written report to the Medical Director General. In addition to the various new researches which have been initiated by members of the group, considerable time has been spent in liaison work between the R.C.N. and the R.N. and U.S.N. Frequent trips to Ottawa have been made and reports on a variety of problems have been prepared in response to requests from the M.D.G. The boundaries of naval medical research appear to be widening and many physical and chemical problems have been attacked by workers trained in these fields. All of the studies are, however, intimately related to the health and efficiency of naval personnel.

The personnel of the Unit now includes, in addition to the authors, Surgeon-Lieut. Edward Sellers, Surgeon-Lieut. J. M. Parker, Surgeon-Lieut. Carleton Smith, Lieut. Comdr. James Campbell and Lieutenant C. R. Cowan, Sub-Lieutenants J. W. Dales and N. R. Stephenson. We are very fortunate in having the full-time co-operation of a number of well qualified civilian research workers in the Banting and Best Department of Medical Research and in the Department of Physiology. Professor W. G. E. Eggleton, Dr. Ruth C. Partridge, Dr. J. B. Bateman, Miss R. B. Durick, Mr. M. Bunker and Miss M. L. Hawxhurst, have all made valuable contributions. The naval and civilian workers are assisted by secretaries and by a number of technicians. Generous grants for this work have been secured through the Subcommittee on Naval Medical Research of the National Research Council of Canada. The naval subcommittee works through the Associate Committee for Medical Research, the chairman of which is Professor J. B. Collip. The Subcommittee has representatives from various medical departments of Dalhousie, McGill and the University of Toronto. A very large part of the support for the Research Unit, is provided from the funds of the two departments of this University which are mentioned above.

Shortly after the previous account of research activities was submitted it was decided that certain further observations and trials should be made at sea. To this end naval

* A progress report submitted to the Medical Director General, R.C.N., and published at his request.

medical research personnel proceeded to Newfoundland in October, 1941. (Surgeon Commander Edward Amos made the trip at the same time and was able to obtain further valuable information on riboflavin deficiency at the Newfoundland base.) Studies were made on two corvettes, and on a destroyer—H.M.C.S. *St. Laurent*—by the authors and Lieut. Comdr. Campbell and Lieutenant Cowan. Valuable information concerning diet aboard ship, bridge and chart-room lighting, general ship's lighting and engine room and boiler room noise levels, was obtained on the Newfoundland-Iceland run. Subsequently the authors spent two extremely valuable weeks with the Home Fleet of the R.N. It was fortunate that Admiral Sir John Tovey, Commander-in-Chief of the Home Fleet and Surgeon-Captain Fitzroy-Williams, F.M.O., were interested in a number of naval medical research problems which had been studied by members of our unit. Admiral Tovey provided an opportunity for the authors to discuss a great many important questions with medical and other officers on a number of ships of different types. We had several opportunities of presenting the findings of the R.C.N. Research Unit and learning the problems and recent accomplishments of our R.N. colleagues. Later, some time was spent on patrol duty in a British cruiser. During this period further observations were made under operating conditions at sea.

On our arrival in London contact was made with Admiral Dudley, M.D.G., R.N., and a little later with Admiral M'Nee, Chief Consultant in Medicine of the R.N. Conferences were held with the D.S.R. (Admiralty) and members of his staff. The R.N. Medical Service and the authorities of the Medical Research Council of Great Britain, which is the official research organization of the British Government, very kindly made arrangements for us to attend all committee meetings which were directly or indirectly concerned with problems of naval medical research. For nearly a month we were kept very busy in this interesting liaison work, the results of which will, we trust, become increasingly apparent. We returned to Canada in January, 1942.

Several groups of research workers in Canada have attacked the age-old problem of seasickness. The R.C.N. Medical Research Unit has been studying this problem in animals and in man. Surgeon-Lieut. Sellers, Surgeon-Lieut. Parker and Sub-Lieutenant Stephenson have accumulated a number of interesting new facts. A more comprehensive program of research in this field is proceeding in McGill University under the direction of Dr. Wilder Penfield, Dr. Babkin, Dr. R. L. Noble and others. This latter study is under the auspices of the Subcommittee on Naval Medical Research of the National Research Council. Efforts are being made to evolve a procedure for the early detection of personnel who will become chronically seasick and to discover a substance or combination of substances which can safely be used to prevent seasickness.

During the absence of the research group from Canada the construction of 40 R.C.N. colour vision test lanterns was proceeding in the shop of the Department of Physiology, University of Toronto. Due to priority difficulties these lanterns were held up longer than was expected, but the final distribution was completed in February and March, 1942. The lantern is now the standard gross colour test for the R.C.N. and is used on all Ishihara failures. The Ishihara-R.C.N.-lantern combination is now used in the official R.C.N. colour vision test procedure as outlined in the recent N.M.O. on this subject. The procedure has been tested against most of the other available colour vision tests by the R.C.A.F. and has received their approval. Models of the R.C.N. lanterns have been presented to the M.D.G., R.N., and the National Research Council of the U.S.A. and most appreciative letters of acknowledgment have been received.

Lieut. Comdr. Campbell and a staff of workers in the Department of Physiology, University of Toronto, have been concerned with applying modern knowledge on nutrition to the formulation of an adequate diet for naval personnel. This has been carried out in co-operation with Commander Wright, P.D.G. and Major Coulter, D.N.S. and has been controlled by detailed studies on the diets served in a number of shore establishments and on a variety of naval vessels. The R.C.N. ration list is now thoroughly up to date, but there are still nutritional problems on corvettes to be solved. Considerable advance in this latter matter has, however, already been made. A very potent vitamin preparation has been devised and is now known as the R.C.N. Vitamin

Tablet.* The use of this material, which contains in one pill the daily requirements of all vitamins known to play a rôle in human nutrition, is now being studied on corvettes. Vitamin supplements will only be used where conditions make it impossible to supply all essential food factors in the meals.

A special committee on lifeboat rations has been set up consisting of the M.D.G., P.D.G., D.N.S. and members of the Research Unit. Surgeon Lieut. de Belle has been working with this group. Recommendations on both the type of ration to be used and the method in which it is to be stored have been made. Food units and water are each to be packed in tin cans. The use of cans permits the exposure of only a small quantity of food and water at any one time, thus eliminating wastage to a very considerable degree. The ration to be used has been chosen for maximum caloric content with minimum promotion of thirst and minimum space requirement. The fact that water is much more important than food has been fully recognized, but the psychological as well as the physiological value of food has been given consideration. Both water and food tins are placed in a large tin of standard size and as many of these latter tins as possible will be placed in each boat or raft.

A vigorous effort has been made by Dr. J. B. Bateman and Lieut. Cowan to evolve an apparatus for the efficient preparation of fresh water from salt in lifeboats. Considerable progress has already been made. Conferences on this problem have been held with both R.N. and U.S.N. workers.

Definite recommendations on special lighting to improve the night vision of personnel on ships' bridges, chart rooms, sea cabins, etc., have been made. Methods of testing the ability of all lookout personnel to see at night are being evolved at present. This has proved to be the most difficult of all eye tests and has given real trouble not only to the Canadian but also to the British and American authorities in all services. The test evolved for use in the R.C.N. has been developed in co-operation with the groups working on these problems in the United States.

A method of protecting the eyes against winds of high velocity has been evolved following a suggestion made by Lieut. Brook. This device has been tested in wind tunnels, in collaboration with the Staff of the School of Science and Dr. A. E. MacDonald of the University of Toronto. The results are most encouraging and sea trials have now been completed.

The set-up for testing visual acuity differs in each naval establishment. An R.C.N. visual acuity test apparatus has been constructed in the University of Toronto and has been approved by the Naval Medical Research Committee of the National Research Council and by Surgeon-Captain McCallum, M.D.G., R.C.N. This apparatus provides for the use of any one of 4 Snellen test charts which may be evenly illuminated by artificial light of controllable intensity. The actual illumination of the chart itself can be measured by a built-in electric photometer. The apparatus may thus be used in a lighted room, the artificial illumination being employed to bring the total illumination up to the standard level as indicated by the photometer. Provision is made for covering the whole equipment when it is not in use. This will prevent the charts becoming dirty and will also eliminate the possibility of their being memorized by waiting recruits. The use of this apparatus should help to eliminate the present divergent results of visual tests on the same individual by different examiners.

Special auditory acuity tests, devised by the R.C.N. research group, have been carried out on several hundred naval personnel. These tests are at present being conducted in Toronto and Halifax and will be extended to other training establishments. Experimental work on auditory fatigue is being carried out by Dr. Partridge in the University of Toronto.

A research on the fitting of plastic contact lenses in certain naval personnel has progressed very favourably. This has been carried out with the collaboration of Dr. Arno Town and of R.C.N. and University of Toronto ophthalmologists.

A study of the condition known as "immersion foot" has been made through the kind co-operation of the naval medical personnel in Halifax. Following the British experience, and civilian practice in the treatment of diabetic gangrene, cooling of the affected part was the treatment favoured by the authorities at Halifax. The Research Unit carried out thermo-electric measurement of skin tempera-

* The first supplies of these tablets were made available to the R.C.N. through the generosity and foresight of Mr. Gordon Leitch.

ture which furnished a means for evaluating the various methods of cooling the damaged extremities. On the basis of these determinations it was possible to improve the technique used for cooling the limbs. A laboratory approach to the therapeutic problems presented by the condition of immersion foot is being made at the present time. The clinical phases of work on this problem have been described in an extremely valuable report by Surgeon Commander Webster and Surgeon-Lieutenants Woolhouse and Johnston.

The Naval Medical Research Unit has been intimately connected with the study of traumatic shock and with the production of dried human serum for use as transfusion material. Dried serum, made in the Connaught Laboratories from blood collected by the Canadian Red Cross Society at its various depots across Canada, is being distributed through the Department of National Defence, to all establishments and vessels of the R.C.N. This material has been used to treat some cases of severe burns in St. John's, Newfoundland, and the medical authorities there believed that it saved the lives of the naval personnel concerned. Great quantities of serum are required for treating either traumatic or burn shock and large stocks of the material should be available whenever there is a possibility of such cases appearing in considerable numbers.

Special life-saving jackets have been tested and the rubber suit used by the Norwegian Mercantile Service has been given extensive trial in Toronto. This particular jacket is made almost entirely of rubber and efforts are being made at present to decrease the quantity of rubber required by the more extensive use of suitable fabrics. A variety of small electric lights to be carried by the personnel at sea have been tried. A very satisfactory light which is automatically turned on when immersed in water for even a short period, is at present under test. These two latter researches are being conducted jointly by R.C.A.F. and R.C.N. investigators.

H.M.C.S. *Naden*, R.C.N.V.R. Divisions in western Canada and in southwestern Ontario have recently been visited by one of us (D.Y.S.) for the purpose of instructing naval medical officers in the use of the R.C.N. colour vision test lantern. All other divisions have now been visited by members of our group. Surveys of the methods of testing visual acuity were made and improvements in the procedures were suggested where such were feasible. The activities and possibilities of the Medical Research Unit were discussed with the C.O. and P.M.O. of each Division. The work carried out to date was outlined and emphasis was put on the fact that this Unit exists for the sole purpose of attempting a solution of medical and physiological problems facing any branch of the Navy. The Commanding Officer and medical officers were urged to submit their problems to the Unit through Surgeon-Captain McCallum.

ELEMENTARY PRINCIPLES OF THE TREATMENT OF HEAD INJURIES*

BY WILDER PENFIELD AND WILLIAM CONE

Montreal

SHAKESPEARE made his excursion into neurophysiology when he referred to the "brain, which some suppose the soul's frail dwelling house". We know now something of the complicated functions of the cerebral hemispheres, but still we find no other "dwelling house" for the soul, nor can we give it any more important major function. In the treatment of head injuries the primary problem is to rescue this master organ from permanent damage.

At this time it is particularly necessary that all members of the medical profession should be familiar with the fundamental principles involved in the care of any case of head injury. Discussion will be limited to three major headings: (1) care of the comatose patients, (2) rescue of the brain from compression, (3) the aftermath.

UNCONSCIOUSNESS

Severe brain and skull injuries do occur without producing unconsciousness, but rarely, and the state of the patient's consciousness is by far the most important single factor to be con-

* From the Department of Neurology and Neurosurgery, McGill University and the Montreal Neurological Institute.

Read before the Canadian Medical Association, Jasper Park, June 19, 1942.

sidered in judging his condition. Indeed, Brigadier Hugh Cairns[1] suggested recently that post-traumatic amnesia might be used as a yardstick* to determine the time after injury before a patient should be allowed to return to work. This might be of help under some circumstances, although the judgment of an experienced clinician should be a better guide, for each case presents a complicated problem.

The initial concussion instantly inactivates neurones, for a longer or shorter period, due to the direct effect of the jar.[2] This immediate paralysis usually produces unconsciousness.

A cautious surgeon will make no attempt to define consciousness. This might lead to philosophical and even theological encounters from which he would hardly escape unscathed. But the policeman or stretcher bearer who brings in the patient believes he knows whether consciousness is absent or disturbed. The medical attendant must go a little farther than that. He must have a conception, however hypothetical, of the anatomical meaning of the absence and impairment of consciousness.

There is a certain portion of the brain the integrity of which is essential to understanding. When this area of the brain is functionless the patient is unconscious. When this area of the brain is functioning imperfectly, a disturbed state of consciousness exists. This vital area may well be "the soul's frail dwelling house", but it is not a chamber nor a centre. It is not placed at the surface of the brain in the recently acquired cerebral cortex. It lies deep in diencephalon and mesencephalon, and contains the pathways to and from the whole nervous system.

A man who is unconscious and motionless may have complete paralysis of the whole brain. If breathing is his only activity the lower brain-stem or medulla oblongata is intact but the upper brain stem is out of action. If he moves about in an automatic fashion, but does not know what he is doing, some areas of cortex have recovered but the upper brain stem and vicinity are not restored to normal activity.

Care of the unconscious.—When a patient is unconscious following head injury he must be protected in many ways. Instead of that he is often neglected or left alone under the mistaken impression that moderate movement will hurt him.

Respiration.—Provide for a free respiratory air-way. Transport him in a prone position so that he will not aspirate his own secretions and vomitus. Many an unconscious patient has drowned during transportation upon his back. Once in a hospital, he should be kept semi-prone and at times he should be prone, with his head in a horse-shoe head rest to allow mucus to drain. In any case, aspirate mucus when necessary and keep his mouth clean. Oxygen should be administered freely if his colour is bad.

Hyperthermia often occurs as the result of paralysis of temperature-regulating centres near the third ventricle. If the extremities are cold and dry then any rise in temperature should be recognized as neurogenic in origin. The treatment for this pyrexia is to take off all the blankets and avoid artificial warming.

If the hyperthermia is associated with hyperpnœa and tachycardia the outlook is grave indeed. Some improvement in the last two phenomena may be produced by repeated small doses of sedative.

Restraint.—When comatose patients are restless and hard to control, do not administer sedatives; instead, look for a cause of pain. The most frequent cause is a full bladder. Catheterization is apt to be most effective in quieting the patient. He may, however, have a severe headache, the cause and treatment of which will be discussed presently.

If, in spite of all that can be done to make him comfortable, a confused patient is still restless, restraint should be used only with moderation. It is better to put him on two mattresses on the floor and allow some latitude of movement. Never use morphine. Occasionally paraldehyde and barbiturates must be resorted to.

Special procedures.—During the first hours after admission of a patient suffering from a head injury take immediate initial stock of the situation. Record the rate of pulse and respirations, the blood pressure, the size of the pupils and their reaction to light, the muscle power of arms and legs, and, above all, describe the state of his consciousness.

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* If the post-traumatic amnesia had a duration of: 5 minutes to 1 hour, prescribe 4 to 6 weeks' convalescence; 1 to 2 hours prescribe 6 to 8 weeks' convalescence; 1 to 7 days prescribe 2 to 4 months' convalescence; over 7 days prescribe 4 to 8 months' convalescence.

That post-traumatic amnesia has some prognostic significance is shown clearly by the figures reported by Air Commodore C. P. Symonds (*Proc. Roy. Soc. Med.*, 1942, **35**: 601). In a series of service patients who had received closed head injuries, 77% of those with less than 1 hour of amnesia returned to duty and 23 were eventually invalided, whereas after 7 days 38% were invalided, and more than 7 days 48%.

If there are open wounds of scalp, or scalp and skull, shave the scalp, sterilize it, remove damaged tissue down to the dura, and close the scalp carefully, provided infection has not begun. If the dura is penetrated, the patient must be transferred to a specializing neurosurgeon who will in some cases carry out a form of restrained débridement upon the brain by means of suction.

Whether the head injury be closed or open, "stock-taking" must be begun at once with x-rays of the skull and lumbar puncture as indicated. The radiographs should be so taken as to demonstrate the position of the pineal gland and choroid plexuses, if these structures are calcified, as well as the nature and position of fractures. At lumbar puncture the cerebrospinal fluid pressure should be measured and fluid removed in three test tubes, used successively, so that a decision may be reached as to the existence of intracranial bleeding.

CEREBRAL COMPRESSION

Physicians nowadays have gone so far as to abolish undesirable mental activity by injuring functions of the brain in various ways, such as lobotomy, therapeutic convulsions, shocks from electrical current. They might well be more concerned with the preservation of mental activity that is not anti-social. Unrelieved cerebral compression is destructive.

The brain is different from other organs in that it is covered by an exoskeleton or cranium. This rigid covering protects against lesser injury but, because of its unyielding nature, renders the brain vulnerable to compression, once the trouble does reach intracranial structures. The brain is vulnerable because it cannot escape and because nerve cells are easily destroyed by oxygen lack.

The signs of *cerebral compression* may be explained with relative simplicity. When the brain is compressed it migrates toward the skull opening, the foramen magnum; but the cerebral hemispheres are held up in place by the tentorium and only the midbrain normally passes through the incisura of the tentorium. The medulla oblongata passes through the foramen magnum below it. Consequently, if under the influence of increasing pressure the temporal lobe is also squeezed into the incisura, or the cerebellum is squeezed into the foramen magnum, advancing paralysis of the brain-stem results at one of these levels, as shown by one of the two following syndromes: (1) midbrain compression, (2) bulbar compression.

At the level of the incisura the midbrain contains the cerebral peduncles made up of the pyramidal tracts and the nuclei and emerging fibres of the oculomotor nerves. In the general vicinity of the midbrain lie also, as we have pointed out above, neural tissue, paralysis of which produces unconsciousness. Furthermore, as shown by Sherrington, complete transverse section of the brain stem at this level produces decerebrate tonic rigidity of trunk and extremities. Consequently, the syndrome of midbrain (or incisural) compression which results from pressure exerted upon the right cerebral hemisphere is (1) dilatation of the right pupil which becomes fixed to light (paralysis of right third nerve), (2) left hemiplegia (paralysis of right pyramidal tract), (3) unconsciousness. This may be called upper brain-stem compression. As it becomes more complete it is followed by dilatation of the other pupil, paralysis of the other extremities, decerebrate rigidity, and death.

However, instead of midbrain compression, the lower brain stem may be strangulated at the foramen magnum. This is produced by the attempt of the cerebellum to pass through the foramen, forming a so-called pressure cone. Pressure upon the medulla oblongata results in the syndrome of medullary compression: (1) slowing pulse, (2) increasing pulse pressure produced by rising systolic pressure, (3) Cheyne-Stokes breathing going on to respiratory arrest.

Now it is obvious that rapidly advancing compression must be relieved by prompt surgical intervention. The emergency is great for the life of the individual is at stake. Evacuation of a subdural clot, which only requires a trephine hole in the right place; ligation of a bleeding middle meningeal artery; evacuation of an intracerebral clot; all of these are possible in expert hands, and in case of doubt two or three trephine holes should be made for exploration, as subdural clots are most frequent.

For moderate degrees of *increase of intracranial pressure* and for the associated headache, frequent lumbar punctures often give relief and probably prevent dilatation of the ventricles as long as the spinal fluid pressure continues to be elevated. When brain-stem compression exists, whether it be midbrain compression or bulbar compression, lumbar

puncture is contraindicated, as it may increase the effect of strangulation.

At this time it is important for us to consider, not the surgical emergencies, but the majority of cases in which operation is not imperative. Here the individual survives but, far too often, many of his ganglion cells do not. He may acquire complaints that will accompany him through a life of semi-invalidism and incapacity. Intracranial pressure can be reduced to some extent by minor procedures, such as elevation of the head, repeated lumbar punctures and dehydration.

In regard to *dehydration* for the relief of brain œdema there has been a good deal of loose thinking. When the patient first arrives at hospital he may in some cases already show acute general dehydration. If that is the case give him such fluid as his general condition seems to demand. After that do not expect that the brain can be consistently shrunken by a little magnesium sulphate, whether given by mouth or rectum, nor by intravenous hypertonic solutions (5% sodium chloride, 25% glucose or sucrose). Such measures produce only a very temporary decrease in intracranial pressure.

Moderate dehydration can be produced by limiting fluid intake to 1,000 c.c. daily or even 600 c.c. This is better than hypertonic administrations. If obvious elevation of intracranial pressure continues with persisting stupor, when none of the more dramatic surgical interventions are called for, consider the possibility of subtemporal decompression, particularly if it seems evident that the quality of the past mental achievement of that individual was on a high level.

In *summary*, it should be remembered that during compression there are many helpful minor procedures to be used: lumbar puncture, fluid restriction, occasional operation, preservation of adequate respiration, clearing out the throat and respiratory passages during unconsciousness, administration of oxygen and elevation of head so as to reduce intracranial venous pressure. All of these things may help to rescue the master organ which makes a man what he is.

THE AFTERMATH

On the fiftieth anniversary of the first operation for brain tumour,* Mr. Wilfred Trotter spoke of all the distinguished physicians and surgeons who had been assembled on that historic day. He then referred to the forgotten man, "the case". It had been said that "he was of a good type and that he took his anæsthetic well". About his appearance on the stage of history there was a "certain tragic dignity. He was young, intelligent, courageous, and he was about to die". Modern methods of neurosurgery make it possible to save many a life. But even though the individual remains upon the stage he may still be left to play a tragic rôle unnoticed. The patient walks out of hospital alive and the surgeon turns with satisfaction to other cares, but what of the man himself?

Headache is the most frequent complaint that follows head injury, being rivalled in its place of discreditable leadership only by alteration in mental capacity and in temper. Furthermore, in this war headache is also being used as an illegitimate entitlement to compensation. This purpose it serves almost as effectively as did that misconception "shell shock" during the last war. Consequently, let us consider carefully the nature, cause and proper treatment of post-traumatic headache.

If we recognize and treat with insight the headache that follows injury, we may also recognize and treat neurosis and may evaluate the elements of anxiety, fear and general inadequacy, desire for compensation, and the feeling of inadequacy which serve as neurotic causes in varying proportion.

The term "post-traumatic head syndrome" is beginning to be used as a blanket diagnosis for men in service in this war. It is applied loosely to those who complain of the after effects of head injury. It may well serve only as a cloak for indifference and ignorance on the part of medical officers and eventually a ticket for pension.

Post-traumatic headache.—Of the true headaches that follow head injury there is more than one cause. Of these, we shall now examine only the following: (1) Continuing abnormality of intracranial pressure; (2) instability of general circulation; (3) meningeal traction.

Abnormality of intracranial pressure.—Subdural collections of fluid or subdural hæmatomas may be produced at the time of accident and persist or increase due to continuing fluid imbibition. This results in chronic increase of intracranial pressure and the headache is only

* This operation had been carried out by Sir Rickman Godlee in 1884.

relieved by trepanation. Also mild degrees of hydrocephalus may be produced by extensive bleeding into the subarachnoid spaces, which tends to block absorption of cerebrospinal fluid for some time after the accident, and thus may produce frontal and occipital headache for a few weeks. Brain œdema results from head injury and, although it may produce lasting cerebral damage, it disappears within two weeks.

Abnormality of general circulation. — It is well known that during convalescence, after many types of illness, the vasomotor system seems to be inadequate to meet the needs of the individual in the erect position and during exercise. Ordinarily this passes in a few days, but after head injuries this inadequacy of systemic circulation is sometimes severe, durable and associated with fainting and headache.[3] It makes its appearance when the individual begins to walk about and undertakes to work. If he is placed on a tipping board it may be found that his blood pressure re-establishes itself slowly when he is tipped from horizontal to vertical.

This headache may be mistakenly considered to be feigned, particularly inasmuch as the man may begin to complain only when he goes back to work or duty. For treatment, graded exercises may be used, beginning with bed exercises or exercises in the horizontal position and gradually increasing to setting-up exercises and walking. But re-establishment may require weeks of faithful work under a determined teacher before a man is up to full labour or a route march. During this time rehabilitation routine should not be overlooked.

Post-traumatic meningeal headache. — This headache is most important of recognition inasmuch as a specific therapy exists. Recognition depends on the patient's description, which should be elicited with great care. It is apt to appear toward the end of the first three weeks, when the headache caused by increased pressure has passed off. The ache is localized to one part of the head. It remains there day and night, spreading at times with less intensity to other parts perhaps, but rarely leaving the focus which is usually near the site of the blow. This headache is made worse by exertion, and may often be made better or worse by change of head position.

Dizziness is a frequent, but not an invariable, accompaniment of this type of headache. A word should be added here about the character of dizziness as encountered in the post-traumatic state. In cases of meningeal headache it has no definitely rotatory character. It is a feeling of unsteadiness often associated with blurring of vision. It is apt to last from 2 to 5 or 10 minutes and the subject then holds on to something or sits down. It often comes on as the result of straining or quick change of position. It has none of the characteristics of the vertigo of Ménière's disease, no sense of rotation in any given direction, no nausea, no tinnitus.

There is also a dizziness that accompanies the post-traumatic circulatory instability. This comes on, as it may in the case of any person who lacks good vasomotor tone, with change of position, particularly from the horizontal to the vertical. Its duration is a matter of seconds, while in patients with meningeal headache the duration is a matter of minutes.

The cause of the pain in meningeal headache is a continuing traction between the brain and some sensitive area of dura.

The treatment is to introduce air into the subdural space while the ventricles are being drained of all fluid so that the brain collapses and pulls away from the dura. This can be done by spinal insufflation alone, or more effectively by lumbar drainage and simultaneous opening of the dura through a trephine hole.

Men who complain of headache after head injury must be studied carefully, increased pressure recognized, circulatory instability recognized, meningeal headache recognized, eyestrain and other causes of headache, recognized, and all of these conditions treated. The remaining patients in this group should have their anxieties and legitimate fears allayed if possible and their capacities assessed. The residue must be taken out of hospital as quickly as possible. If they are a burden on the fighting unit from which they came, shift them to other employment. A man who is inadequate and unhappy in the paymaster's department may make a good soldier, driving a truck.

CONCLUSIONS

We have, in this paper, ignored most of the major surgical procedures which are called for in the treatment of head injuries. These must be carried out by specially trained men along the lines of sound surgical practice, now moderately well established. But in these days with "the three corners of the world in arms", most

medical men must see and understand and play a part in the care of broken heads and their aftermath.

When a man is unconscious, take care of his respiration, prevent hyperthermia, look after him energetically on the principles of general physiology. In so doing you will rescue his brain from compression and anoxæmia.

If he returns after the injury with complaints, try to analyze the causes of his post-traumatic ailment, remembering that among these causes may be fear and anxiety, for he knows full well that this was an accident which threatened the "soul's frail dwelling house".

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RÉSUMÉ

Dans les traumatismes craniens on doit envisager: la perte de connaissance, la compression du cerveau et les suites éloignées du choc. L'amnésie post-traumatique est un bon guide: la durée de l'amnésie déterminera la durée de la convalescence. On doit protéger le malade inconscient en veillant à sa respiration et en le transportant dans la position couchée à plat ventre; on surveillera l'hyperthermie et on évitera les réchauffements artificiels. Eviter les sédatifs et penser à vider la vessie. Eventuellement on aura recours aux barbituriques; jamais à la morphine. On notera soigneusement, le pouls, la respiration, la température et la T.A. La compression siégera soit au cerveau moyen, soit au bulbe. Le syndrôme de compression du cerveau moyen se reconnaît à la dilatation de la pupille homolatérale à la compression, à l'hèmiplégie croisée et à l'inconscience; la compression bulbaire s'objective par le ralentissement du pouls, l'élévation de la tension systolique et le rythme de Cheyne-Stokes. On mettra en œuvre les precédures appropriées pour la diminution de la tension intracranienne. On hydratera le malade avec parcimonie. Parmi les suites éloignées figurent la céphalee, les étourdissements, les changements du caractère. Il faudra identifier l'étiologie de la céphalée pour y apporter la thérapeutique curative.

JEAN SAUCIER

AN ANALYSIS OF PNEUMONIA DEATHS SINCE THE INTRODUCTION OF SULFONAMIDE THERAPY*

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SINCE the introduction, a little over three years ago, of sulfonamide therapy for pneumococcic pneumonia, a multitude of papers have been published to familiarize the practitioner with the advantages and dangers of the drugs, the merits of one as compared with, or combined with, serum therapy. Despite regional and seasonal variations in the virulence of the organism, all have been thoroughly impressed by the great reduction in morbidity and mortality from the disease as a result of the newer therapy. Most authors now quote mortality rates in the neighbourhood of 10%. This figure, while relatively low as compared with pre-sulfonamide or even pre-serum days, still represents a considerable hazard. Even in hospitals where bacteriological co-operation is available, prognosis remains uncertain, and there has been a difference of opinion as to whether the drug should be used alone, or in combination with serum. Aids in this direction have come from the sputum studies of Frisch and Price,[1] who have found that the number of extracellular pneumococci and the amount of capsular material in rusty or bloody sputum may be used as a reliable aid in the prognosis of pneumococcic pneumonia. In addition, Bukantz, De Gara and Bullowa[2] have found in their studies of specific circulating polysaccharides that there is more of that material in the blood of the older age-groups with pneumococcic pneumonia, and with this a greater morbidity and higher mortality rate.

Few analyses of these pneumonia deaths are seen in the current literature, and it appeared that a review of this kind might contribute something towards the fuller understanding of, and, hence, the better management of the patient with lobar pneumonia. Perhaps it might be said that non-specific factors should be emphasized both in determining prognosis and in specific and in non-specific therapy.

The purpose of this communication is, then, to analyze in some detail the fatal cases of (pneumococcic) lobar pneumonia, which have been treated in the Royal Victoria Hospital, Montreal, during the last three years. With this in view, the cases are classified as to sex, age, type of pneumococcus, presence or not of bacteriæmia (when blood culture was per-

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formed) number of lobes involved, presence of heart disease (classified as either rheumatic, arteriosclerotic, luetic, hypertensive or thyrotoxic); presence of tuberculosis, sinusitis or bronchiectasis; other disease states, nutrition and development; day of disease when admitted to hospital, type of treatment employed, day of disease on which death occurred, and a clinical comment reviewing the course of the illness. The reference to sulfathiazole or sulfapyridine in Table II indicates that, unless otherwise stated, adequate blood levels of the free drug were obtained rapidly, usually by an initial intravenous administration. The serum when used was type-specific rabbit serum, and was given by the rapid method on the day indicated.

The mortality rate is quite comparable with that of many published series, being 10.5% among 200 cases (see Table I). The twenty-one

TABLE I.

Type of pneumococcus	*Number of cases*	*Number of deaths*	*% Mortality*
I	30	3	10.0
II	39	1	2.5
III	39	9	23.3
IV	12	1	8.0
V	19	1	5.2
VI	8	1	10.2
VII	18	2	11.0
VIII	9	0	0
IX	1	0	0
X	0	0	0
XI	6	2	33.4
XII	1	0	0
XIV	3	1	33.3
XVII	3	0	0
XVIII	1	0	0
XX	2	0	0
XXIV	1	0	0
XIX	5	0	0
XXIII	2	0	0
XXVIII	1	0	0
	200	21	10.5

deaths are analyzed in Table II. As was expected, all deaths occurred with infections with the lower types of pneumococci.

Nine of 39 cases (23.3%) of type III infection succumbed to the disease. In four of these, there was a proved bacteriæmia. In one case, the blood culture was negative and in four cases, unfortunately, no blood culture was taken. Of the surviving 30 cases, 6 were known to have a negative blood culture. Three survivors who on admission had a bacteriæmia had stormy courses, two developed bronchiectasis succeeding residual pneumonitis, the other an empyema. The clinical course of those with type III infection was prolonged as compared with that of any of the other types.

Of the three deaths with type I infection, two had a proved bacteriæmia, while blood culture was not made in the third case. The clinical course here, however, strongly suggested a bacteriæmia. There were 6 recoveries of this type known to have a bacteriæmia.

In the 39 cases of type II infection, there was one death, and blood culture of this case showed a heavy growth of type II pneumococcus. Four of the 38 survivors showed bacteriæmia. The one fatal case of type IV infection had a bacteriæmia, and, indeed, a meningitis.

The single death among 18 cases with type V infection had over 500 colonies of pneumococcus per c.c. of blood on admission to hospital. No blood culture was made on the dehydrated, malnourished infant of two months of age, who had in addition to a confluent bronchopneumonia, bilateral suppurative otitis media. In addition to the type VI pneumococcus in this case, the *Hæmophilus influenzæ* was cultured from both lungs and ears at autopsy.

One of the two deaths with type VII occurred in a man whose blood culture was negative on admission. Autopsy showed four lobes involved, whereas, on admission, there was clinical and radiological evidence of the involvement of only two lobes.

Bacteriæmia was present in the two cases of type XI infection.

Thus, it is seen that a bacteriæmia was proved in 12 of the 21 cases and in only 3 cases was a negative culture obtained on admission to hospital.

The sex-incidence of fatal outcome is exactly paralleled by the incidence of the disease among the two sexes (76% male). It will be noted that (excluding the infants) all deaths occurred in those over 40 years of age, with an average age of 56.6 years. It is striking that the average age of pneumonia survivors was 36.1 years.

In 5 of the cases only one lobe was involved by the pneumonic process. In another, although only one lobe was consolidated, in it multiple abscess cavities were found. In 8 cases, two lobes were involved. In this group one patient had an empyema, another, multiple abscess cavities and empyema. In 4 cases three lobes were involved and in the final group of three cases four lobes were involved by the process.

Eleven cases had appreciable disease of the

TABLE II.

TYPE	AGE	BACTEREMIA	NO. LOBES INVOLVED	HEART DISEASE A.R.L.H.	NOURISHMENT. DEVELOPMENT.	CHR. INF. LUES TBC.	BRONCHIEC-TASIS SINUSITIS	OTHER DISEASE STATES	ADMISSION D. of DIS.	THERAPY	DIED D. of HS	COMMENT
I	41	Not done	4	0	(a) Good (b) Good	0	0	Idiopathic epilepsy	2	Sulfa-pyridine	3	(Lobar) T.103, P.120, R.40,B.P. 75/55. Hb.130. Pulse became more rapid and thready. B.P. did not rise. D. in 26 hours. Wbc. 16,000.
I	68	+	2 with empyema	0	(a) Good (b) Good	0	0	Gen. A.S. (marked)	4	--	4 2 hours after Adm.	(Lobar) Adm. & died in periph. vascular collapse. No Wbc or Hb. determination.
I	73	+++	2	A auric. fibrill.	(a) Poor (b) Good	0	0	Dehyd-ration Anaemia.	7	Sulfa-thiazol, Serum digitalis	12	(Lobar) Delirious & dehydrated on adm. C.S. & drug given I.V. 16 hrs. after adm.when bacter-emia reported. 200,000 units serum given. High temp., tachy-cardia; D. in A.M. 12th day.
II	64	+	3	None.	(a) Poor (b) Poor	0	Chronic Catarrh Sinusitis bilateral	Asthma Marked em-physema Polycy-themia	4	Thiazol Serum	12	(Lobar) Wbc.26,000,Hb.86%.Temp. low, 99-101°;P.ranged between 100-130/min. R.became more rapid; in O_2 tent continuously.C.S. & plasma given I.V. 160,000 un. serum;asphyxia cause of death.
III	41	Not done	1 R.C.C. multiple abscess formation	0	(a) Fair (b)Asthen-ic.	0	0	Gen. A.S. (mod)	3	Sulfa-pyridine	12	(Lobar) Onset abrupt; treatment prompt on adm. Profound tox-aemia. T.,P., & B.P. good throughout. Wbc. 16,000. Hb. 86%.
III	53		1	0	(a) Poor (b)Asthen-ic.	0	0	Gen. A.S. (mild)	5	Sulfa-pyridine	6	(Lobar) Entered & remained till death in periph. vascular col-lapse, with cold skin, rapid thready pulse, & low B.P. Wbc. 8,000. No Hb.determin.
III	65	A.M. Not done P.M. Neg.	1	H	(a) Good (b) Good	0	0	Prostatic hyp. Cardiac hyp. Gen.A.S. (mod)	3-4	--	6-7	(Lobar) Came in in comatose state. Thought to have Ca. of prostate with cerebral met-astases. Remained in coma. T.101-103.P.90-120.B.P good. Died toxaemia.Wbc.4800.Hb.85%.
III	59	Neg.	1 (R.U.L.)	A. Cdr.Scl. Cong. failure	(a) Good (b)Sthen-ic.	Tbc. Healed L.U.L.	0	Marked Emphysema Gen.A.S. (mod)	4	Sulfa-pyridine	14	(Lobar) Wbc.33,000;Hb.76%. Had cong.failure compensated alkal-osis, CO_2, 85. Good T. response to therapy, with secondary rise of T. Death due to heart fail-ure,pri. by emphysema.
III	76		1 plus dif. bronchitis	0	(a) Good (b) Good	0	Supp. sphenoid-itis	Gen.A.S. (mod) Anaemia	?3	Sulfa-pyridine	10	(Furulent bronchitis) Cough 3 mos. Hist. of onset difficult to ascertain. Patient deaf. High fever. Wbc.11,000. Initial good response,death from toxemia in 4-5 more days. Hb.88%.
III	47	++++	3	0	(a) Fair-poor (b) Fair	0	0	Emphysema	2	Sulfa-pyridine	4	(Lobar) Intense toxemia. Wbc. 9000. Irrational on adm. Went into periph. vas. collapse on 4th day. No Hb. recorded.
III	40	No A.M. culture P.M. Neg.	2	Cardiac enlarge-ment (H)	(a) Good (b) Good	0	0	Chr. pyelo-nephritis (mod)	7	Sulfa-thiazol	35	(Lobar) Did fairly well though febrile, but on 35th day had acute left-sided failure,cause? (no infarct or cor. occlusion) Adm. Wbc.22,000; Hb.92%. Day of death, Wbc. 12,200, Hb.92%.
III	57	No A.M. culture P.M. Negative.	1	A.S.& M.S. (R)	(a) Good (b) Good	0	0	Gen. A.S. (mod) Nephro-sclerosis	2	Sulfa-pyridine	3 5 hrs. after adm.	(Lobar) Ad. in periph. vasc. col. Died 5 hrs. after adm. Wbc. 8700. Hb. 78%.
III	53	++	2	Anaemia	(a) Poor (b) Poor	0	0	Mal-nutrition dehyd-ration	9	Sulfa-pyridine	10	(Lobar) Adm. very ill.T.103. Died from toxaemia in 16 hrs. Hb.102%.Wbc.9000. Drug given by mouth. No blood levels done.
IV	45	+ (C.S.F.)	2	coronary sclerosis	(a) Poor (b) Good	0	0	Early Cirrhosis Avitamin-osis	3	Sulfa-pyridine	6	(Lobar) Pneumomeningitis & pneu-monia in chr. alcoholic. Died 6 days after onset with high fev-er & rapid pulse. Wbc.26,000, Hb. 12%, on admission.
V	74	+++++	2	A & H (fibril-lating) No failure	(a) Good (b) Good	0	0	Gen. A.S. (marked)	3½	Sulfa-thiazol & Serum 140,000 un.	5	(Lobar) Adm. in very critical cond. Thiozol & digitalis,then serum the night before death. No further spread but D. from in-tense toxemia.Wbc.11,500.Hb.74%.
VI	2 mos.	Not done	2 abscesses & empyema	0	(a) Poor (b) Good	0	B.S.O.M.	Walnut. Dehyd. from diarrhoea	2-3	Support-ive		Confl.Broncho,Diarrhoea, 7 days, 2 days drowsy. Toxic erythema on adm. Ran septic temp. Tachycardia Wbc.10,000, Hb.86%. Pneumo & H. Infl. cultured from lungs & ears at P.M.
VII	53	+++	3	A & H	(a) Good (b) Good	0	0	Diabetes & Obesity (marked)	2-3	Sulfa-pyridine Serum, 160,000 un Cortin	26 hrs. after Adm.	(Lobar) Adm. on 2-3 day. Pneumo found on direct typing & serum & drug given. Wbc. 2,600, Hb.72%. Patient was in periph. vas. col-lapse with leucopenia. After in-itial rally died in P.V.C.
(H) VII	43	Neg.	4	0	(a) Good (b) Good	0	0		3	Sulfa-pyridine	14	(Lobar) Wbc.22,000. Initial good response, then drug discont. with rise in temp. which was from ex-tension of disease. Died from tox-emia. Hb. 94%.
XI	2 mos.	++	3	0	(a) Poor (b) Poor	0	Str. B.S.O.M.	Premature birth (4½ lbs.) Anaemia	3	Sulfa-pyridine & blood	4	(Broncho) Running ears 4 days,con-vulsions 1 day. Died within 14 hrs. of adm. Intense toxemia, poor re-sistance. Wbc. 20,000, Hb.70%.
XI	62	+ adrenal abscess	4	Coronary sclerosis no fail-ure.	(a) Poor (b) Good	0	0	Gen. A.S. (mod)	8-9	Symptom-atic	18	(Lobar) Adm. with rt. LL disease, then spread to L.L.L. Wbc.20,000. Death due to toxemia. Hb.90%.
XIV	62	Neg.	2	0	(a) Poor (b) Good	0	B.C.M.S.	Asthma Emphysema Gen.A.S. (mod)	6	Sulfa-pyridine	12	(Lobar) Had asthma many yrs., also hyperthyroidism. Developed pneu-monia;no resp. to drug treatment. Wbc.12,000, Hb.94%. High Temp. per-sisted with tachycardia. Death due to exhaustion & heart failure,lt.

cardiovascular system, either of inflammatory or degenerative origin. Sinusitis was known to be present in five of the cases. Marked emphysema was present in 4 cases (22%). There was only one case of diabetes, which was combined with obesity, arteriosclerosis and hypertensive cardiovascular disease. One patient was a chronic alcoholic, with avitaminosis and early hepatic cirrhosis. Malnutrition was notable in 11 cases (50%). The incidence of associated disease is seen to be over 90%. In the surviving 179 cases, the incidence of comparable disease states was only 29% (or 32%, if latent lues and early prostatism be included).

In only four of the fatal cases, was specific therapy instituted on the second day of disease. In two no specific drug or therapy was given. Two patients died within 6 hours and 3 within 26 hours of admission to hospital.

A combination of drug and rabbit serum was given in four cases. In one case the specific serum was given within three hours of admission, on the basis of the clinical appearance and the presence in a stained smear of the patient's rusty sputum of large numbers of diplococci with excessive capsular swelling, a few leucocytes and no phagocytosis. In the other cases, the serum was given late in the disease on receipt of the knowledge of a positive blood culture, the serum being given about 16 hours before death in two of the cases.

Seven of the cases presented the clinical picture of shock, or peripheral vascular collapse, with cold extremities, low blood pressure and rapid, thready pulse. Unfortunately, complete blood studies were not done in any of the cases in this series. A recent patient who went into shock on the second day of disease and not included in the series because of inconclusive bacteriological data, might well be mentioned. Here hæmoconcentration (hgb. 112; plasma proteins 7.2 grm. %; blood histamine 0.01 gamma per c.c.) was found with clinical evidence of shock which had been present for about 14 hours. In this case, despite an initial rally, with disappearance of hæmoconcentration and rise in blood pressure to a normal level, circulatory collapse returned and death occurred. In this case the response followed the administration of 75 c.c. of cortin and 1,500 c.c. of plasma. In none of these cases reported in the tables was anti-shock therapy (as it is now understood) administered.

It is evident that there is a low but appreciable mortality from pneumococcal pneumonia. Age, type of infection, and bacteriæmia appear to be the most important factors. The presence of associated disease must also be taken into consideration in determining prognosis. (Sputum smears were of value during the last year, as an additional aid in determining prognosis and hence type of therapy). Early energetic specific (sulfonamide) drug therapy is obviously of great importance, supplemented by specific rabbit serum if the prognosis appears to be poor as judged by the yardsticks available.

The relatively high incidence of shock is of interest. The mechanism of shock in lobar pneumonia is at least in part due to loss of plasma into the lungs, as suggested by Andrews and Harkins.[1] It seems justifiable to suggest that further trial of anti-shock therapy instituted early in peripheral vascular collapse in pneumonia, might further lower the mortality rate.

SUMMARY

1. An analysis is made of 21 fatal cases among a series of 200 cases of pneumococcal lobar pneumonia.

2. A mortality rate of 10.5% is comparable with the majority of present-day published figures.

3. Sex incidence of mortality is exactly proportional to the incidence of the disease among the two sexes. (Male 76%; females 24%; three to one.)

4. All deaths (excluding infants) occurred in persons over 40 years of age. (Average-age fatal cases, 56.3 years; average-age survivors, 36.1 years).

5. The mortality rate among type III infection is disproportionately high (23.5%) in a series of 39 cases.

6. The incidence of bacteriæmia in fatal cases is striking.

7. Malnutrition or associated disease (involving the cardiovascular system, lungs, kidneys, liver or sinuses) was present in over 90% of the fatal cases and in only 29 to 32% of the survivors.

8. No specific drug or serum was given in 2 of the cases included in these deaths and two patients died within 6 hours and two within 26 hours of admission.

9. Seven patients died with peripheral vascular collapse (shock) for which no anti-shock therapy was instituted.

10. A suggestion is made that the recognition of non-specific factors, both in determination of prognosis and in management, would further lower the mortality rate from pneumococcal lobar pneumonia.

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THE PROBLEM OF FUNCTIONAL DISEASE AS SEEN IN INDUSTRY*

BY D. E. BELL, M.D.

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A FEW days ago I asked my colleagues at the Compensation Board for their opinion as to what proportion of the time lost following industrial injury is due solely to functional conditions. They were to take into consideration the malingerers, of whom there are relatively few, the psychoneurotics, and, in addition, the cases of those timid souls who take a little longer than the average to get over their injuries.

The estimates I received ran from 15 to 25%. Now, if we assume that some such figure as 20% is somewhere near correct, and at the same time consider that in the year 1941 in the Province of Ontario alone, the man-day loss due to industrial injury was one and a quarter millions, it becomes readily apparent that we have here food for very serious thought. Furthermore, it is abundantly clear, taking a long range view, that the incidence of neurosis is steadily increasing, and, while that increase is less evident during times like the present when work is plentiful and wages high, one shudders to think of the situation that will have to be faced when industry once more swings into low gear.

Now where does the trouble lie, and what is the remedy? A well known psychiatrist once said, "An accident, some more or less severe anxiety symptoms, a false pathology [*sic*] accepted by doctors, lawyers and the public, a lively apprehension about the future, together with compensation, in place of understanding and rational treatment make a combination that has brought many a decent citizen to disaster".

A complete answer to the question of etiology involves consideration of a great many factors, including those tendencies which contribute to produce a psychopathic personality, such as poor heredity, faulty environment at home and at work, social insecurity, etc. Add to this a mild injury, conscious or subconscious motives of escape, desire or both, and, finally, compensation, and we have all the ingredients of a witch's brew.

The injury, as a rule, is of minor importance; at times it would seem little more than an incident. The term "traumatic neurosis" is therefore really a misnomer. "Compensation neurosis" is much to be preferred, for, while trauma plays a very minor rôle, compensation plays a very large one. Examination of the files of many of our confirmed neurotics reveals that great doubt existed at the time the claim was first received that there had been an injury at all. We have come to feel that, generally speaking, the nature of the injury is much less important than the particular doctor who happens to be in attendance, for the ignorance among medical men of even the existence of these functional states, much less a clear understanding of the influences tending to bring them into being, is appalling.

ILLUSTRATIVE CASE

M.E. Not long ago I had occasion to see a workman who some three months before had sprained the carpometacarpal joint of his thumb. The injury was such as might ordinarily have been expected to lay the man up for two or possibly three weeks, yet when at the end of three months he was still off work and the reports of the surgeon in attendance began to refer to a condition which he called "median causalgia" it was decided it was about time to take a more active interest and the man was brought in for examination.

It was found that the thumb was flexed and adducted, with the fingers tightly flexed over it and there was a glove anæsthesia to the lower third of the forearm. When his attention was diverted the fingers and thumb could be completely extended, and they remained so until his attention returned to them when the hand slowly went into a clench. Here was the simplest kind of a hysterical reaction, which any fifth-year medical student should have been able to recognize but which a surgeon of wide experience had

* A paper presented at the Toronto Academy of Medicine, November, 1942.

utterly failed to appreciate. His difficulty, of course, was that he had sought to justify a number of subjective symptoms that had no anatomical basis.

The trouble with a great many medical men is that in their eagerness to treat the injury they neglect to treat the patient. Their surgical skill may be beyond reproach, yet it never occurs to them to question subjective symptoms even well after anatomical recovery appears to be complete. Worse still, they unwittingly lend themselves to the production of a functional state by careless remarks in the presence of the patient and his friends. Many a patient with avulsed transverse processes has been told he has a fractured spine instead of a muscle injury, and, of course, there are always friends who can recall cases in which dire consequences followed such injuries, and some who may even know the amount of the pension received by so-and-so. Suggestion may have a baneful influence. On the other hand it may be a power for good, depending on the authority of its donor and the impression made upon its recipient. To a patient the word of his medical attendant is the voice of experience and the confidence the doctor holds should be used for constructive purposes rather than wasted in gloomy prognoses.

J.H. To illustrate what I mean, I would like to refer you to the case of a man aged 53, who was jammed in an elevator gate, receiving contusions of his head, shoulders and arm. The ulnar nerve was evidently bruised, as he had signs of incomplete ulnar paralysis.

We saw him between two and three months after the accident, at which time his symptoms all centred in the hand. There was some hyperæsthesia in the ulnar distribution, which we assumed to be functional, because, when his mind was diverted the hand could be squeezed almost at will. Faradic response was normal, and there was nothing objective, except that the skin was thick and scaly and had evidently not seen soap and water for weeks. Also, it was swollen from lack of use, for he had carried it in his pocket. The patient told us that he went to his doctor daily for electrical treatment, which, from his description, consisted of exposure under an infra-red lamp, but still more amazing was the statement that his doctor had cautioned him against using the hand for several months, else he would do the nerve irreparable damage.

Psychotherapy disguised as physiotherapy, in addition to plenty of hot water, soap and a scrubbing brush, cured him in three days, and, rather proud of ourselves, we sent him back to his doctor with a letter explaining what had happened, adding our hope that he would shortly be able to resume his employment. But did he stay cured? Not a chance! His doctor pooh-poohed the idea of a functional condition and without a word to us again cautioned him against using the hand, with the result that when we next saw him a couple of months later, it was as bad as ever. Even so, it yielded to treatment as before, although it took a little longer.

Now, here was a man who was willing to be cured by constructive suggestion, but whose doctor would not allow it. We had him at the Clinic five times in all and he was twice seen by specialists; one cured him by manipulating the wrist and another by what he termed a "little high-grade quackery".

Apart from demonstrating the stupidity of this particular medical attendant, this case illustrates something else, and that is the readiness of lay people to accept functional disability without question. This man, in addition to soliciting the aid of five local medical men—so far as I know, all there were in town—to write to the Board on his behalf, also prevailed upon the following to do likewise: his employer; a clergyman; his landlord; the mayor; the local relief department; the department of welfare; six members of Parliament; a Toronto daily paper. All these good people were ready to believe that we had failed to appreciate the seriousness of the man's condition, and were quite willing to lend their assistance to help rectify an unfortunate mistake.

Now what is the answer to the problem? First let me ask what *your* attitude is toward a situation which admittedly is deplorable. Is it that "It can't happen to me"? "There is nothing like that in my practice"? If it is, then I venture to say it is going on all around you and you do not know it. If the medical profession can be made to realize that it has a real live problem on its hands, an excellent start will have been made. Unfortunately, the attitude of many is that matters of psychology are outside the scope of the surgeon and something for the neurologist and psychiatrist to worry about. By the time, however, the neurologist or the psychiatrist is sent for, the case is usually too difficult and complicated to permit of an easy solution. Furthermore, any surgeon or physician who thinks he can ignore psychology as an agent of healing is passing up one of the most potent forces at his disposal.

The solution appears to lie in education of the profession and laity alike as to the existence of these states, the influences that favour their development, and how these influences may be counteracted. It is no disgrace to be a neurotic, yet, on the other hand, the patient does not need to be glamorized and that is exactly what is happening every day.

The industrial physician has a responsibility toward the workers of the plant with which he

is associated, a responsibility to advise management of any unhealthy working conditions likely to cause nervous strain, such as faulty lighting, inadequate ventilation, undue monotony, lack of recreation, rest periods, etc. A few days ago I talked with a man whose contribution to the war effort consisted of machining in the neighbourhood of three hundred small steel rods every hour, or one every twelve seconds. He had already been on that particular job for about three months and, as far as he knew, would remain there indefinitely. Neither he nor his employer appeared to be conscious of the fact that the foundation for a first-class psychic upset was being laid. What the effect of the employment of vast numbers of women in war industry will be, only time will tell. Women appear to stand up under the monotony of mass production at least as well as men, yet, on the other hand, when they do go neurotic they don't fool.

Industry has undergone vast changes within the last two or three decades; changes far beyond the capacity to which the human nervous system is able to accommodate itself. Where stood the bench of the master craftsman who experienced the joy of creation as from raw material he saw rise under his experienced hands a thing of beauty, the assembly line moves inexorably along with its ever-increasing demands on nervous energy. Is it not time to stop and ponder whence all this is leading and to consider our responsibility as a profession to the race of tomorrow?

THYROTOXICOSIS AND ITS TREATMENT*

BY WALTER R. CAMPBELL

Toronto

IN this paper I wish to draw attention to certain aspects of the pathological physiology of the thyroid and to discuss available means for their control. No attempt will be made to discuss treatment as a whole. I will say that I have not seen the dramatic results alleged to follow radiation by x-ray and radium at times, and the results of less intensive radiation treatment do not impress me as accelerating the spontaneous recovery which ultimately takes place in many cases. In the field of radio-active iodine where preliminary tests seem to foreshadow promising results, I have no experience. At the present time I believe that a combination of medical and surgical measures offers the best chance of adequate control, though still leaving in some cases much to be desired.

The thyroid gland is a ductless gland but differs from other ductless glands in some important respects. Like the pancreas, adrenals, and pituitary body, it produces a hormone, but it possesses a particularly rich blood supply for its size. Indeed its resting blood supply per gram per minute normally exceeds that of any other part of the body. The capacity for expansion of the circulation under unusual circumstances and pathological conditions is very great. Secondly, though iodine is found elsewhere in the body in extremely small amounts, the thyroid gland contains iodine in by far the highest concentration and in amounts exceeding that in any other parts of the body except the muscles, which exceed it so greatly in bulk. The iodine in the body, as in the thyroid itself, is found both in inorganic form and as organic combinations. So far as we know, inorganic iodine has no particular function in the body as a whole, and it is perhaps best regarded as iodine in course of assimilation, transport, and katabolism of the organic fraction, even though it may be loosely attached to protein molecules. Most of the organic iodine is present as thyroxin, with a smaller amount as di-iodo-tyrosin and other compounds, possibly katabolites of thyroxin.

Little of the iodine in the thyroid gland is in inorganic form. The parenchymal cells have the function of capturing it and rapidly converting it into organic combinations. One-third of it is present as thyroxin, the remainder as di-iodo-tyrosin, the latter a product which is probably gradually converted into the hormone thyroxin. Normally storage of these compounds is accomplished by uniting them with a globulin in a loose peptide linkage and extruding it into the acinar spaces where it forms the colloid material, iodo-thyreo-globulin. Release of the

* From the Department of Medicine, University of Toronto and the Medical Service, Toronto General Hospital.

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thyroxin in amounts of 1/3 mgm. per day into the general circulation is probably accomplished by proteolysis of the iodo-thyreo-globulin.

The thyroid then functions as an iodine collector, a thyroxin factory, a thyroxin storage warehouse, and a body thyroxin regulator. Its functions in these directions are materially altered by alterations in the circulation and pathological or perhaps only hyper-physiological changes in the gland cells.

The thyroid problem is then an iodine problem at bottom, whatever the trigger agencies which may set in motion the pathological sequences in the gland. Here in Ontario we have an iodine-poor soil with production of much colloid or simple goitre. In some areas a normal thyroid is almost unknown. In Ontario likewise we have a very high proportion of toxic goitre, and, incidentally, just as soon as a few more generations have cropped our land our cretin problem will loom still larger. The remedy, of course, is already well established by the experience of other countries. Supply the needed iodine in such a manner that the whole population cannot escape using it. Simple prophylaxis can abolish for the most part our goitre problem.

Following Marine, we may trace a cycle of changes in the thyroid consequent upon iodine lack. First, increase in blood supply to the thyroid, increase in height of parenchymal cells, loss of colloid, mitosis, and infolding and heaping-up of the epithelium or hyperplasia. An exhaustion atrophy may occur or a reversion to a resting phase in which the blood supply decreases, the colloid, large in amount but poor in iodine, distends the acini, whose cells become flattened to cuboidal or even almost squamous form. This stage is known as colloid goitre. This unstable semi-compensated state may be succeeded by an actively hyperplastic phase time after time, while if it passes physiological limits it gives rise to the symptoms of toxic goitre. Doubtless many factors, mostly unknown to us, serve to initiate the hyperplastic phase but iodine deficiency, absolute or relative, must play an important rôle in the production of the symptomatology of toxic goitre.

This symptomatology, however, is not dependent directly upon iodine itself but rather upon the iodine-containing hormone, thyroxin, produced and regulated by the gland. Thyroxin is a catalyst acting directly upon all organs and tissues to increase their activity and also acting indirectly, through catalysing the nervous system, to further increase their activities. With iodine starvation alone, or induced by secondary factors, a hyperplastic state of the cells develops, and failure of regulatory action of the thyroxin stores ensues. By increasing the activity of the circulation supplying the gland itself the vicious cycle is complete, failure of regulation becomes complete, and intoxication results which is limited only by the amount of thyroxin available to be leached out of the gland.

Excess of thyroxin in the general circulation steps up the activity of all cells, increases the heat production, and gives rise to the symptoms of toxicity. There is, in my opinion, little to warrant the belief that the thyroxin is in any way different from normal thyroxin, except in its failure of regulation by the abnormal thyroid, a feature which is common to the diffuse and the so-called adenomatous type of goitre.

Increased heat production also takes place during exercise, under the stimulus of bacterial toxins, and in leukæmia. The increased heat production under exercise takes place discontinuously and only for a limited part of the day, and is limited by fatigue or exhaustion. Excessive heat production under thyroxin stimulus continues 24 hours a day until the thyroxin is destroyed or its liberation from the gland is interfered with. Not only is the basal metabolism raised, but the useless overactivity of the cells of the body raises the total metabolism to 4,000 to 6,000 calories per day, impairing or destroying the cells in the process and rendering them less capable of combating future strain. In other words thyrotoxic action is not limited to episodes of malignant fury referred to as crises or storms, but is initiated early in the disorder and renders the patient less able to withstand these crises. It is important to recognize and counter this action early in order to prevent or overcome the so-called crisis which is frequently the result of inadequate treatment of the less readily discernible but cumulative toxic action of thyroxin.

Normally, the body is protected from change of temperature by an elaborate system of defences of which the cooling mechanism is here most important. Pulmonary ventilation and excretion of urine have comparatively little influence in the human subject, but radiation, conduction, and evaporation of water from the body surface are much more important. These mechanisms are employed in the hyperthyroid

patients as well, but it must be pointed out that in hyperthyroidism the excess heat production is continuous and the mechanisms are continually employed to the utmost to maintain a normal body temperature. Evaporation of more water from the skin is the only way in which cooling can be increased. Small isolated increases in body temperature give warning that the limit of capacity of the cooling mechanism is being approached. It is well then to provide an increased fluid allowance for these patients. At least 3,000 c.c. of fluid per day are necessary. Some increase in the salt intake is also desirable and may be combined with the increased food intake required. The latter is made necessary by the increased breakdown of foodstores and even essential body tissues under the influence of the catalyst, thyroxin.

The food most valuable for repairing these body tissues is protein, but there is not only a limit to the amount which will be eaten but also a deterrent factor in its high specific dynamic action which would increase the rate of metabolism. Proteins are therefore used in moderate quantities, fats, which, like carbohydrates, have a low specific dynamic action, may be eaten as desired, but the main reliance for balancing the great waste of energy is upon carbohydrate, which must be used in large amounts in both liquid and solid form. To maintain appetite and enhance carbohydrate utilization it is of course essential to provide adequate B complex, particularly thiamine.

Much can be done for these patients from a psychological standpoint. Every effort should be made to keep them comfortable, quiet, happy and content. Bed rest is most essential. Selection and limitation of visitors is necessary. Sedatives are usually necessary. I prefer nembutal at night and luminal in small divided doses during the day. Such measures tend to limit the extravagant waste of energy which threatens to overcome the heat-dissipating mechanisms.

In the treatment of hyperthyroidism iodine is at once the most important remedy and the patient's greatest source of danger. The course of events when iodine is used should be clearly understood. With the assimilation of a dose a considerable portion of it is picked up by the hyperplastic cells and the circulation through the gland is diminished. The previously turgid gland softens a little as a result of diminished blood supply, the thyroxin is no longer leached out of the gland as fast as it is produced but is stored combined in newly formed colloid, mostly as di-iodo-tyrosine. Meantime the thyroxin in the general circulation is being destroyed at the rate of 10% per day, and in proportion as it is unreplaced the metabolism falls and the symptomatology improves. The acini gradually distend with colloid, the hyperplastic cells being altered from columnar to cubical or even lower types of epithelium to surround the mass. But the storage capacity is strictly limited, the turgidity of the thyroid steadily increases, the gland becomes stony hard, and any further thyroxin produced is again secreted into the blood stream with an inevitable recrudescence of the toxic symptoms.

The attempt to treat patients with toxic goitre with iodine alone is unsound because the beneficial effects are so temporary and are succeeded so frequently by a phase of increased toxicity. Properly applied, iodine reduces the surgical mortality to negligible figures. A patient who must be rested and reiodized is not nearly so good a surgical risk. For a favourable outcome of operation iodization should be adequate and not excessive. The hard gland is a warning of over-iodization and impending storm and furthermore deprives the patient of the benefit of iodine in the control of a thyroid storm if that should occur. A dose of iodine to over-iodized patients in storm results in prompt hyperthermia, while it would still be able to quiet the storm in a properly prepared patient. By and large, one minim of Lugol's solution daily will prepare the average patient for operation in 30 days, 5 minims in 10 to 14 days, 10 minims in 7 to 10 days. More than 15 minims once daily does not accelerate the process materially and may produce over-iodization, thus depriving the patient of the benefits of iodine in post-operative storm. Under suitable circumstances iodine is life-saving, under other circumstances, dangerous.

Thyroid crisis or storm occurs in untreated hyperthyroidism in those patients allowed to become dehydrated. Even a mild infection is dangerous in these cases. It occurs also in post-operative cases as a result of operative trauma, of increased blood supply to the traumatized gland, or pre- and postoperative dehydration, and in postoperative patients who acquire infection, usually of the lungs, following operative measures. Liberal fluids pre- and postoperatively are valuable in preventing storm. Thyroid

storm may always be traced to one fundamental cause, the overthrow of the heat-regulating mechanisms. But, in contrast to the commonly accepted opinion, the prognosis is good if sufficient time is available.

The remedies must be promptly applied. Adequate sedation must be ensured. Adequate fluids must be supplied, usually by the intravenous route. Ten per cent glucose in saline and in distilled water is most satisfactory if given liberally. An ice-bag to the gland is useful in decreasing the circulation through it. The patient may be covered with a sheet drenched in alcohol and an electric fan played over the body, remembering, however, not to carry the cooling process too far. In cases where it can be used safely the intravenous injection of 10% solution of sodium iodide is the most important treatment; 2 to 6 c.c. every three or four hours until the temperature commences to fall is sufficient in most cases to bring about recovery. But even when iodine is contraindicated a further remedy may be applied. The patient may be drenched in his own sweat. No patient is in thyroid storm unless his skin is red, dry as a chip and burning hot, dehydrated, in a word, to the point where he cannot produce sweat to evaporate from the skin. To overcome this fluids must first be liberally supplied by the intravenous route, even though the patient has cardiac failure of some duration. If the patient then can retain it, 15 to 20 grains of aspirin by mouth is often effective in initiating diaphoresis; more frequently, however, it is necessary to give pilocarpine intravenously. One-sixth of a grain is sometimes sufficient but a quarter of a grain is more certain to accomplish results. It is perhaps advisable to use this drug with some caution in older people on account of its action on the heart. A small dose of atropine will abolish this effect. A profuse sweat and a fall of temperature of 1½ degrees takes place within an hour. If excessive bronchial secretion occurs, again atropine may be used. Despite these disadvantages, the drug is valuable when it is used before it is too late, as in the stage of hyperthermia or acute cardiac failure. Other diaphoretics are sometimes effective, but are more likely to induce vomiting.

Nothing has been said as to supportive treatment for the heart. Surprisingly little effect is produced by digitalis on the rate of a heart poisoned by thyroxin alone, and some danger exists that the drug may itself produce poisoning if persisted in. Intravenous injection if necessary of digoxin 1/4 to 1/3 mgm. in saline, may, however, be of value if evidences of cardiac failure are present or the heart is fibrillating as a result of previous disease. Likewise in crisis its use may be of some benefit. Other preparations of digitalis are less valuable because of their slow action and the nausea and vomiting induced when they are employed in effective dosage.

Summarizing then, the functional derangements resulting in thyrotoxicosis have been discussed. Iodine deficiency, stimulating an hyperplastic phase in the parenchymal cells, induces uncontrolled release of thyroxin into the general circulation. Action of this hormone raises the metabolic rate to levels with which the normal heat-dissipating mechanisms are more or less incompetent to deal. The importance of limiting energy expenditure and the means for accomplishing it have been indicated. Provision should be made for replacement of the excessive tissue wastage largely by carbohydrate additions to the diet. The cooling mechanism must be supplied with liberal fluids to enhance its efficiency, not only to control crisis but also to avoid it. The place of iodine in the preoperative treatment of goitre is discussed, together with the dangers of its prolonged or uncontrolled administration and its use in suitable cases of thyroid storm. The latter is seen as an acute overthrow of the heat-regulating mechanism. Suitable treatment to assist the latter, including the induction of diaphoresis, is suggested.

The recipe for a sandwich spread which, eaten on wholemeal bread, provides a balanced ration containing protein, fat, carbohydrate, calcium, and vitamins A, B, and D has been given by Professor V. H. Mottram as follows: Take as much skimmed milk cheese as desired (dried milk will make a form of cheese) and mix with it the same amount of margarine or butter. Add as much chopped parsley as the mixture will take, and some finely chopped spring onion. Flavour with chutney or cayenne pepper. For vitamin D add mashed sardines.—*J. Roy. Inst. Pub. Health & Hygiene*, 1942, **5**: 164.

THE ACCURACY OF TESTS FOR SYPHILIS WITH PARTICULAR REFERENCE TO THE LAUGHLEN METHOD

BY G. F. LAUGHLEN, M.D.

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THE original serological test for syphilis was introduced in 1906 by Wassermann and his associates.[1] The accuracy of this test was low, but nevertheless it proved a valuable contribution to the diagnosis of syphilis. Many alterations and suggestions to improve it were made, but they were not readily accepted. Twelve years after its introduction Morton[2] wrote, "It is now believed that the old original Wassermann method is the only reliable one to use. Various short cuts have been devised and different modifications introduced, but they have been found to be unreliable and as a consequence have all been dropped."

The introduction of the flocculation or precipitation methods by Meinicke[3] in 1917, and by Szent-Györgyi[4] in 1918, led to the discovery of many new and simpler methods. The acceptance of these new tests was very slow, extending over many years. Because no machinery existed for evaluating them tests were dependent for recognition upon the accumulation of favourable reports. Such methods of comparison never afforded very reliable evidence of their comparative merits, and when the number of existing tests reached a considerable figure it was seen that surveys on a large scale should be undertaken.

One survey was made in Copenhagen, one in Montevideo, and another was conducted in the United States in 1935. In the 1935 survey, the United States Public Health Service distributed portions of blood samples to each author serologist who conducted the testing in his own laboratory. Under such ideal circumstances nearly all the methods were able to show a high degree of accuracy and sensitivity. As a result, a standard was adopted which required diagnostic tests to show 90% sensitivity and 99% specificity.

Following the nation-wide survey of 1935, several States undertook surveys within their own laboratories, using for the most part tests which were already approved. These surveys revealed that some laboratories were unable to show as good results as others when using the same test. These were really surveys of the efficiency of the laboratories rather than the method employed. The experiences gained proved valuable in planning the second large survey in the U.S.A., in which one originator from Cuba, one from Mexico, and one from Canada were included. This was again conducted by the U.S. Public Health Services, who invited the originators to go to Washington and carry out the testing in laboratories which they provided. This survey was conducted from October 20 to 31, 1941, and 19 author serologists responded. Some of them carried out testing by more than one method, making a total of 30 different test procedures.

The preliminary report of their findings appeared in the May, 1942, issue of *Venereal Disease Information*. In this report comparative tables and charts were shown, but no commentary or analysis was given. It stated that "a comprehensive report dealing with the details of organization, a detailed description of techniques which participated and an analysis of the results obtained will be published at a subsequent date."

In this paper it is not intended to make an analysis or comparison between the individual methods, but to use the information contained in the Washington report to show the accuracy of the Laughlen and other syphilis tests in general. This should prove of interest to medical practitioners who might fail to read the preliminary report and who would like an explanation for certain inconsistencies which occasionally occur in testing blood for syphilis. The figures given below are from the tables and graphs and the grouping into series follows the arrangement of the preliminary report. The original paper should be consulted if more details are desired.

THE MALARIAL SERIES

This consisted of 12 blood samples. Only one method obtained 12 negative results. The Laughlen test showed some degree of positivity in 4 samples; most of the other tests showed a greater percentage of positives.

While the series was small it was sufficient to show that malarial infection in an individual would render doubtful the finding of a positive test for syphilis.

THE LEPROSY SERIES

This consisted of 60 samples. Some degree of positivity was shown by all methods ranging from 13.8% to 70%. From these findings it can be stated that a positive blood test in a patient with leprosy must not be accepted as indicative of syphilis.

THE TUBERCULOSIS SERIES

This consisted of 59 samples from patients with an established diagnosis of tuberculosis. Twelve flocculation (including the Laughlen) and five complement fixation methods obtained 100% negative. Eleven other methods obtained some degree of positivity ranging as high as 5.1% positive and 3.4% doubtful.

From these findings it can be stated that tuberculosis does not affect the Laughlen and most tests for syphilis to any great degree.

THE MALIGNANT GROWTH SERIES

This consisted of 49 samples. One-half of the methods obtained 100% negative. The others obtained positive or doubtful findings ranging as high as 31.6% for one method. The Laughlen test gave one positive and one doubtful result.

These findings indicate that the presence of malignant growth is a possible source of error in testing for syphilis.

THE CONVALESCENT SERIES

This consisted of 131 samples from afebrile cases recovering from various illnesses. Only 7 methods obtained 100% negative in this group, the other tests showed positive or doubtful results ranging as high as 11.4% for one method. The Laughlen test showed 0.8% positive and 2.3% doubtful.

These findings indicate that a patient during convalescence may show some degree of positivity to syphilis tests. Since this constitutes a small source of error it appears advisable to avoid taking blood samples following an acute illness.

THE FEBRILE SERIES

This consisted of 46 samples from patients with temperatures over 100° F. Within this group 18 methods gave 100% negative. Ten tests showed some degree of positivity. One method gave 28.3% positive. The Laughlen test gave no positives and one doubtful test.

These findings indicate that fever may lead to a slight error in performing syphilis tests. The error is less than that shown in the convalescent group.

NORMAL DONORS

This consisted of 169 samples. The results obtained show the specificity of the different methods as compared to the accepted standards. Seven tests (5 flocculation and 2 complement fixation) secured less than 99% specificity. The others showed over 99%. The Laughlen obtained 99.7%.

THE SYPHILITIC SERIES

This consisted of 45 samples from untreated early cases, 119 from treated cases and 212 from cases of over 4 years' duration. For the complete series the average sensitivity was 70.5%. The Laughlen test gave 69.5% and the highest shown by any one was 79.4%.

The methods which were shown to be low in specificity and which were referred to above, showed a high percentage of positives in this series. If these oversensitive tests were not considered in the analysis the average sensitivity was less than 70.5%. The sensitivity for all tests was below the accepted standard. This must have been due to the high percentage of treated and old cases which were used as donors. It could not be attributed to the lack of sensitivity of the methods employed because several of them have been proved to possess over 90% sensitivity with routine hospital samples. The Laughlen test which showed about the average sensitivity in this group secured 98.5%, in a survey conducted in Baltimore under the Maryland Board of Health in 1941.

GENERAL DISCUSSION

The Wassermann or complement fixation tests considered as a group appeared to equal the flocculation tests in accuracy and sensitivity.

The supersensitive or exclusion tests as a group appeared to equal the diagnostic flocculation tests in sensitivity and accuracy. They failed to show the higher sensitivity that is expected of such methods. The two complement fixation and 5 flocculation methods which gave less than 99% accuracy in the group of normal donors appeared to have secured greater sensi-

tivity than the average at the expense of accuracy. One or two methods appeared to be a little below the average in sensitivity, and, as might be expected, they showed a high rating for specificity. The majority (about 20 out of 28) fell between these two extremes (oversensitive and undersensitive). The Laughlen was included in this group.

If this middle group were taken as representing the most satisfactory tests for the diagnosis of syphilis, a question concerning them would be in order, *viz.*: Do they possess imperfections that lead to an error in diagnosis in some cases? The answer is that a perfect test has not been secured. The blame for inconsistencies is too frequently placed upon the tests employed. More often it has been the laboratory and not the test that has been at fault. Perhaps the greatest source of error lies outside of both the method and the laboratory. The above report has shown several sources of error *viz.*: leprosy, malaria, malignancy, convalescence and hyperpyrexia, which may lead to wrong (doubtful or positive) reports. It cannot be considered an error in the test method if negative or doubtful reports are given on samples from old treated cases.

Accuracy cannot be secured without the cooperation of medical staffs who submit the samples. The samples should be sterile and well preserved and should be accompanied by sufficient history to indicate if there is clinical evidence of recent or old syphilis or if treatment has been given. If the sample has been secured from a patient convalescing or suffering from a disease other than syphilis, this should be so stated. Lastly, the choice of the method employed rests largely with the laboratory. There is ample evidence as seen from this report and numbers of other reports, that the simple tests can yield results equal to those done by the more complex methods.

The preliminary report did not deal with techniques other than to state that they would be published at a later date and there is nothing in the report to indicate the complexity or simplicity of any method. The survey failed to show that a method because of its simplicity or for some other reason might have material advantages over other methods. For example it is not shown that the Laughlen method is economical of time and material and is adapted to the performance of single or emergency tests.

The Washington survey has furnished new and valuable information and confirms the generally held opinion that most syphilis tests when properly employed and interpreted will yield accurate and reliable results.

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RÉSUMÉ

Les résultats obtenus à Washington sur la valeur des divers tests de la syphilis démontrent que la plupart: déviations du complément ou flocculations donnet des résultats précis auxquels on peut se fier. Le test de Laughlen a la valeur des autres épreuves. Les sources d'erreur doivent être reconnues: ce sont la lèpre, la malaria, les tumeurs malignes, la convalescence et les pyrexies.. JEAN SAUCIER

MEMORANDUM ON POSSIBLE METHODS FOR THE PREVENTION OF RHEUMATIC MANIFESTATIONS IN THE ARMED FORCES

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EVIDENCE is now accumulating that acute rheumatic fever and the less typical manifestations of the disease are relatively common amongst the armed forces of Canada and Great Britain. Green[1, 2, 3] has described a number of outbreaks in naval training establishments in Great Britain and mentions that of 114 cases, 104 had pyrexia, 97 joint pains and 102 showed evidences of carditis. The subsequent history of these was as follows:

No carditis	12
Temporary murmurs	27
Persistent mitral systolic murmurs but no other signs	31
Death from cardiac failure	1
Pericarditis	8
Aortic reflux	4
Mitral reflux (11 developing stenosis)	26
Established mitral stenosis	11

Thus no less than 49 cases exhibited one or other of the more grave lesions typical of rheumatic fever.

CAUSATION OF THE DISEASE

While the exact etiology of acute rheumatism is not yet known, it is probable that two primary conditions must be fulfilled before the disease can develop. The first is that there shall have been a streptococcal infection and the second, some as yet unrecognized factor in the environment, for some localities and strata of society are more susceptible than others.

CONNECTION BETWEEN STREPTOCOCCAL INFECTION AND RHEUMATIC MANIFESTATIONS

It has been known for some time that typical attacks of rheumatic fever are preceded by an acute streptococcal infection of the throat. In the interval between the throat infection and the development of the rheumatic attack—the so-called silent period—the patient is apparently quite well. The majority of streptococcal infections of the throat do not have any such sequelæ and only a very small proportion are followed by typical acute rheumatic fever. Nevertheless, an appreciable number are followed by some of the milder forms of rheumatic manifestation.

While the streptococcal infection of the throat is usually a typical attack of acute tonsillitis, these manifestations have followed scarlet fever, scarlet fever of so mild a type that desquamation may be the only sign of infection and infections which resemble the common cold or influenza.

In consequence of this it is to be expected that the incidence of rheumatic fever in any community will parallel the incidence of streptococcal infection. In the study of Green of five different naval training establishments this point is brought out. Table I constructed

TABLE I.

Centre	*Throat infections (Scarlet fever, tonsillitis and pharyngitis)*	*Acute rheumatism*
Ha	10 per 1,000	0 per 1,000
Tv	60 per 1,000	10 per 1,000
Sg	200 per 1,000	22 per 1,000
Ew	680 per 1,000	22 per 1,000
Ac	310 per 1,000	70 per 1,000

from a diagram in his paper shows this. While the correlation between the incidence of the two diseases is not exact it is significant that in the two centres with the lowest rate of infection there was very little rheumatic fever. The same author also showed that there was no statistical correlation between rubella, measles and chicken pox, and the incidence of rheumatic fever in these units.

VARIETY OF STREPTOCOCCI RESPONSIBLE

The infection of the throat is invariably due to hæmolytic streptococci belonging to group A. This group may be divided into 30 or more types by agglutination but there is no evidence that infection with any of these types is more likely to be followed by rheumatic manifestations.

IMMUNITY CHANGES

Using the antihæmolysin titre of the serum as an indicator of immunity, Coburn has shown that during uncomplicated tonsillitis, the titre of the serum rapidly rises and quickly falls during convalescence. When rheumatic manifestations occur, however, the titre remains high and may remain so for as long as the rheumatic manifestations remain active.

THE CONNECTION BETWEEN ENVIRONMENT AND RHEUMATIC FEVER

Following the work of Coburn and others it is well known that rheumatic fever is rare in tropical countries. But there is also considerable variation in its incidence in temperate climates. This is shown in Table II which is abstracted from an article by Keith.[4]

TABLE II.

Country	*Average incidence of rheumatic fever in school children*
Great Britain.....	2.08 per cent of school population
U.S.A.....	1.36 per cent of school population
Canada.....	3.92 per cent of school population

Moreover, in any one area, the incidence may vary considerably. Thus Paul found that in the western United States 4.5% of Indian children in the north had rheumatic heart disease, whereas in the central areas the incidence was 1.9% and south near the Mexican border only 0.5%. Very similar differences in the incidence of streptococcal infections between the two towns of Santos and Sao Paulo in Brazil were noted by Coburn, the former being warm and at sea level, whereas the latter is cool and temperate in climate. There would seem to be little doubt that it is temperature which is the governing factor.

There is also evidence that the disease is associated with economic status and housing

conditions. Thus in a study of New Haven school children, Paul found that the incidence of the disease in schools in poor districts was 4.8%, in better districts 3.1% and in private schools only 0.6%; while Perry, working in Bristol, found direct relationship between the incidence of the disease and overcrowding in the home.

It should be mentioned that streptococcal infection as a whole tends to be commoner in cold climates than in hot, to be commoner amongst the poorer classes than amongst the rich, and to be favoured by overcrowding. For these reasons it could be equally well claimed that cold, poverty and overcrowding favour the development of streptococcal infection, which in its turn tends to be followed by rheumatic manifestations. Indeed, Green has shown that if streptococcal infection breaks out in the summer, rheumatic infection may also occur.

Nevertheless there is some evidence that environment or social status may play a part, for Green has pointed out that recruits from Tyneside were much more susceptible to rheumatism than those from the rest of the country, the incidence of the disease amongst 385 recruits from Tyneside being 101.3 per 1,000 whereas in the remainder it was 52.8 per 1,000. It is well known that Tyneside was one of the most severely depressed areas of Great Britain before the present war, with attendant dietary deficiencies and bad housing. But because of this it is probable that recruits from this area were more likely to be immune to streptococcal infection so that the high incidence of rheumatic fever amongst them is of some importance.

A study of three naval training establishments by Dudley[5] also points in the same direction. The incidence of rheumatic fever in three establishments are given in Table III. Unfortunately he gives no figures for the incidence of definite streptococcal infections but does give the figures for sore throat. It may be assumed that some of these infections were streptococcal in origin.

Conditions at these different depots varied considerably. H.M.S. *Impregnable* consisted of three old wooden battleships. It was a training establishment for boys who entered at about 15½ years of age. They slept in hammocks between decks with about 18 inches between. There was no attempt to split the area up in any way, so that the quarters were both crowded and conducive to cross infection.

TABLE III.

Unit	*Morbidity per 10,000 per annum*	
	Rheumatic fever	*Sore throat*
Seagoing ships in home waters 81,000 men	59	450
Total Navy, 150,000 men	60	634
Shotley Training Depot, 1920-24 1,400 boys	89	1,084
Greenwich Royal Naval School 1,000 boys	60	1,377
Shotley Training Depot, 1917-20 1,400 boys	365	1,614
H.M.S. *Impregnable*, Training ship 1,500 boys	521	3,970

Shotley Royal Naval Training Establishment housed the same type of boy and of the same age-group. The sleeping quarters were considerably better, beds being provided with three feet spacing between. In 1920 the general hygienic control of the establishment was considerably tightened although no change was made in the sleeping arrangements.

Greenwich Royal Naval School housed boys of 12 to 15 years of age. The sleeping arrangements were good, there being 9 rooms with 70 to 126 beds in each. They were light and airy, the average distance between the beds being 2 feet.

There were considerable differences in the morbidity rate for rheumatic fever in the different units. Those with the worst general environment, namely H.M.S. *Impregnable* and Shotley before 1920, had rates which were 8 and 6 times higher than Greenwich, Shotley after 1920, or the Navy as a whole. This would suggest that the environment, irrespective of the amount of tonsillitis, is of some importance in predisposing to the development of rheumatic fever.

PREVENTION OF RHEUMATIC MANIFESTATIONS

In view of the information given above, it is probable although not yet proved that unsuitable, overcrowded quarters may predispose to rheumatic infections. Although attention to this factor alone may prove of value, we still do not know how to prevent a rheumatic attack once a streptococcal infection has occurred. Other than general measures, it is, therefore, obvious that the best method of preventing rheumatic disease is to prevent the streptococcal infections in the first place. In order to effect this, it is necessary to know the methods by

which such infections are transmitted and acquired. This is discussed in the next section.

TRANSMISSION OF STREPTOCOCCAL INFECTION OF THE NASOPHARYNX

By identification of the type of the organism, it is usually possible to demonstrate that they have been derived from a carrier, a convalescent carrier, an incubating case, or an atypical infection. Of these the convalescent carrier is the commonest.

The work of Dudley, Griffith, Glover, Bradley and others has shown that these infections of the nasopharynx are, for the most part, acquired in the sleeping quarters and not at work, meals, play and other activities of the day. Not only can the infection be traced almost from bed to bed, but Dudley has shown that in schools with both day boys and boarders, it is the latter who have become infected during a scarlet fever epidemic. Thus at the Royal Naval School at Greenwich there are 100 day boys and about 1,000 boarders, the only difference between the two groups being in the place of sleeping. During a period of observation extending over 32 terms, there was not a single case of scarlet fever amongst the day boys but no less than 423 cases amongst the boarders.

It was believed for many years that the transmission of these infections in the sleeping quarters was due to the expulsion of droplets containing the organisms over the space between the beds by coughing, sneezing or talking on the part of the carrier during the night. In view of this, elaborate schemes were put into action in order to obtain as much space between the beds as possible.

Recently, however, it has been shown[6, 7] that the organisms are expelled from both carrier and patient inside relatively heavy droplets of saliva which fall almost directly downwards when the subject is speaking. When coughing or sneezing, they are projected further in a horizontal direction but it is doubtful whether they are ever propelled more than about 2 feet horizontally by even the most violent efforts. Direct bed to bed transmission of infected droplets is, therefore, highly improbable.

When the subject is standing up, the organisms of his nasopharynx tend to infect his clothing or any object which is below the level of his mouth. When he is in bed, the bedclothes will receive almost the whole of his microbial output. This infection of the bedding by cases or carriers has been actually demonstrated.[8, 9] So long as the droplets on the bedding remain wet, no harm is likely to ensue, but they very quickly dry. In this condition, the microbes are quickly released into the atmosphere if the bed is made or in any way disturbed. It has, for instance, been shown that the bacterial population of barrack rooms may be twenty times greater during the hour following reveillé than immediately before. If there are carriers or cases amongst the personnel, the number of pathogenic streptococci in the atmosphere is increased accordingly.

It is therefore probable that in the transmission of these infections the organisms are derived from carriers who have polluted their bedding during the night, so that when they rise in the morning, the infected particles become disseminated far and wide and enter the nasopharynx of the other inhabitants of the sleeping place. For this reason, a carrier probably infects his neighbours indirectly by way of his bedding rather than by direct projection of his organisms across the space between the beds.

It is probable that a number of other bacterial infections such as meningitis and diphtheria which enter the new host by way of the nasopharynx may spread in very similar fashion. That is to say, the bedding of the carrier becomes polluted during the night, his organisms are released into the air in the morning and either cause actual infections or become established in the nasopharynx of his neighbours and so bring about an increase in the carrier rate. This will, in time, be followed by the appearance of cases. The success which attended wide spacing of the beds in barrack rooms adopted during the last war for the prevention of meningitis was therefore probably not due to prevention of droplet infection from nasopharynx to nasopharynx but to a considerable reduction in the bacterial population of the room during the critical periods of the day, with consequently less probability of the inhabitants becoming cases or carriers.

On the other hand, there is circumstantial evidence that virus infections such as influenza, common cold, and measles can be spread by the finer particles or droplet nuclei which are able to travel long distances in a horizontal direction when the subject speaks, coughs or sneezes. Direct nasopharynx to nasopharynx transmission of such infections is therefore not only possible in the sleeping place but also during

the ordinary contacts of the day. This probably accounts for the high infectivity of these infections and the velocity with which they can spread. The prevention of virus infections of this type is therefore not only a different problem from that of microbial infections but will probably prove to be much more difficult.

CONTROL OF STREPTOCOCCAL INFECTIONS

There is a good deal of evidence that this type of infection is much more likely to become serious amongst recruits than amongst those who have been enlisted for some time. It is therefore obvious that every effort should be made to prevent or ameliorate streptococcal infection during the first few months after a recruit has joined. Precautions which are advisable for recruit training depots, etc., may well prove to be unnecessary in the case of permanent units. The following suggestions are therefore put forward more for training establishments than for units containing trained men.

General management of barrack rooms.—It is usual for the beds to be completely dismantled every morning and for the blankets to be shaken and folded. This is not only quite unnecessary but is highly dangerous for it is the best possible way to disseminate infection. There is no particular reason why the beds cannot be merely straightened and only dismantled occasionally. When this is done, the windows should be wide open in order to disseminate the infected particles as quickly as possible.

It is usual for barrack rooms to be swept by fatigue parties while the men are out on parade. This practice is good, but damp sawdust, tea leaves or some similar substance should be provided to lay the dust; and they should on no account whatever be swept while the men are still about. Oiling the floors as recommended by British workers for hospital wards is probably unnecessary.

Spacing of the beds.—The beds should be spaced as widely as possible. This is recommended not so much to obtain as great a distance between the nasopharyngeal orifices as possible but to keep the bacterial population of the air down during the early morning, the most dangerous period of the day.

Type of bed.—The use of double tiered bunks is unsound. It is true that double the number of men can be housed in one room with apparently adequate space between the beds. If the transmission of infection occurred by means of droplets projected across the intervening spaces, two or even three layers of beds would be as safe as one layer. But if, as has been pointed out above, infection occurs by way of the bedding, it follows that the more men there are to each room the greater chance there is that one will be a carrier and so transmit infection to his room mates. It is recognized, however, that this practice has become almost standardized in Canada and it may be too late to alter it.

Bacteriological control.—Every effort should be made to identify throat carriers and to segregate them from their fellows. The bacteriological examinations necessary to achieve this need not be elaborate, indeed they would be much simpler than the detection of diphtheria carriers. Because about two-thirds of those who carry hæmolytic streptococci in the throat have strains which are not members of group A it is essential to identify those with group A and only segregate them. If this is not done, the number of carriers to be handled becomes too large and there is always the danger that those without group A may become infected with that organism if they are placed in dormitories along with those who are carriers. It is quite impossible to identify group A strains merely by inspection of the blood agar plates, for which reason it is necessary to carry out further tests. Serological tests, while ideal, are time-consuming and require skilled personnel but reasonably accurate tests are now available which may be used instead. The following scheme is suggested.

Swabs should be taken from the throat of every man in the huts or barrack rooms in which cases have occurred. If possible, the whole unit should be swabbed but this may prove too great an undertaking. The swabs should be plated on blood agar and incubated for 24 hours. At the end of this time, any colonies showing beta hæmolysis should be fished to two plates, one consisting of blood agar containing 1% glucose[10] and the other, of blood agar containing 40% bile.[11] On the 1% glucose blood agar, strains of groups A and B give a green or viridans appearance, the members of the other groups giving full beta hæmolysis. Further differentiation is achieved by the second plate containing 40% bile blood agar. On this, strains of group A will usually

not develop whereas those of group B will. In this way it should be possible to identify carriers of group A hæmolytic streptococci within 48 hours.

These carriers should then be placed in a separate barrack room or hut where they sleep. In all other activities they can mix with the remainder of the unit. The hut set aside for them should be out of bounds to the remainder of the unit but there is no reason why its occupants should not visit other huts provided they do not sleep in them.

During the subsequent period watch should be kept for any type of nasopharyngeal infection. If such occurs, swabs should be taken from the patient and all his room mates and examined for group A hæmolytic streptococci. Any with such organisms should be immediately sent to the segregation hut.

No treatment is apparently of any value for ridding carriers of their organisms. It is recommended, however, that their sleeping quarters in particular should be as spacious as possible in order to cut down reinfection of those who are losing their organisms. The occupants should be examined bacteriologically once a week and as soon as a man is proved to be free of his organisms he can return to his former barrack or hut.

Those sent to the segregation hut should take their bedding with them but must leave it behind when they return. Arrangements should be made to render it non-infective in some way before it is reissued. Hot water with a temperature above 60° C. will suffice for this.

The number of group A carriers to be expected in a unit will vary considerably. On an average, 7% of normals are carriers but this figure may be much higher during an epidemic.

Other methods.—Ultraviolet light, aerosols, propylene glycol vapour and oiling the blankets have been suggested as suitable methods for cutting down cross infection. It is possible, although not yet proved, that all these methods may be of value but the most suitable techniques have not yet been worked out and they are all rather elaborate and require special apparatus. For these reasons, they cannot as yet be recommended for service use.

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DIFFUSION OF SULFONAMIDES OUT OF CERTAIN BASES

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A GREAT number of active principles used for local application are soluble in oil, and if incorporated into an oil or fatty base will readily diffuse from the base into the surface of a wound. This would also be true were they contained in an emulsion of the water-in-oil type in which the continuous phase is oil. In the case of sulfonamides, however, which are soluble in water, either a water-soluble base or an emulsion of the oil-in-water type, in which the continuous phase is water, would be required in order that the drug would be continuously fed into the wound.

In this work we were primarily interested in the diffusion of the sulfonamides out of a solution of polyvinyl alcohol in water. This solution is being used here as a water-containing base in the treatment of wounds, including burns both clinically and in experimental animals. For reason of comparison, some of the more commonly used bases were included in the study.

Polyvinyl alcohol (hereafter referred to as P.V.A. for convenience) is a white powder which when dissolved in cold water and then heated forms a clear solution. A 7% solution has a viscosity which just allows it to be poured on a wound.

EXPERIMENTAL

A 4% solution of agar in Ringer's solution was prepared and to this was added Ehrlich's solution which in contact with sulfonamides

turns red. After being placed in test tubes and allowed to gel, a layer of the vehicle containing the sulfonamide was placed over the gel and the extent of diffusion measured at definite intervals.

The diffusion rates of sulfonamides out of various bases are shown in the accompanying figures.

RESULTS

It will be seen from the graphs that the water-containing vehicles such as solutions of P.V.A., acacia and tragacanth, and the oil-in-water type of emulsions all show a free delivery of the sulfonamide, while the fatty and paraffin bases such as simple ointment, paraffin ointment, lard and hydrous wool fat show very little or no delivery of sulfonamide.

In Fig. 1, it will be seen that the sodium salt of sulfathiazole diffuses out of the P.V.A. only slightly faster than sulfathiazole. As the sodium salt is soluble in water to the extent of 5% while the sulfathiazole has a solubility of only 0.09%, one would expect diffusion to take place much more rapidly. Although this is little in evidence at the beginning of the experiment, and therefore not well shown in the graph, the actual concentration of the sodium salt in the agar in close proximity to the base later became much higher than that obtained with sulfathiazole.

When the rate of diffusion from a thick layer of sulfathiazole in P.V.A. Fig. 1, or from an emulsion, Fig. 4, is compared with that from a thin layer, there is little difference. When the rate of diffusion from a thick layer of crystals of sulfathiazole was compared with that from a thin layer formed by lightly dusting the crystals on the surface, diffusion takes place at approximately the same rate for the first 150 hours. After this, however, delivery from the thin layer falls off, while that from the thick layer continues. This is shown in Fig. 3 (*c*) and (*d*).

DISCUSSION

Although these experiments do not represent the true conditions in wounds, they strongly

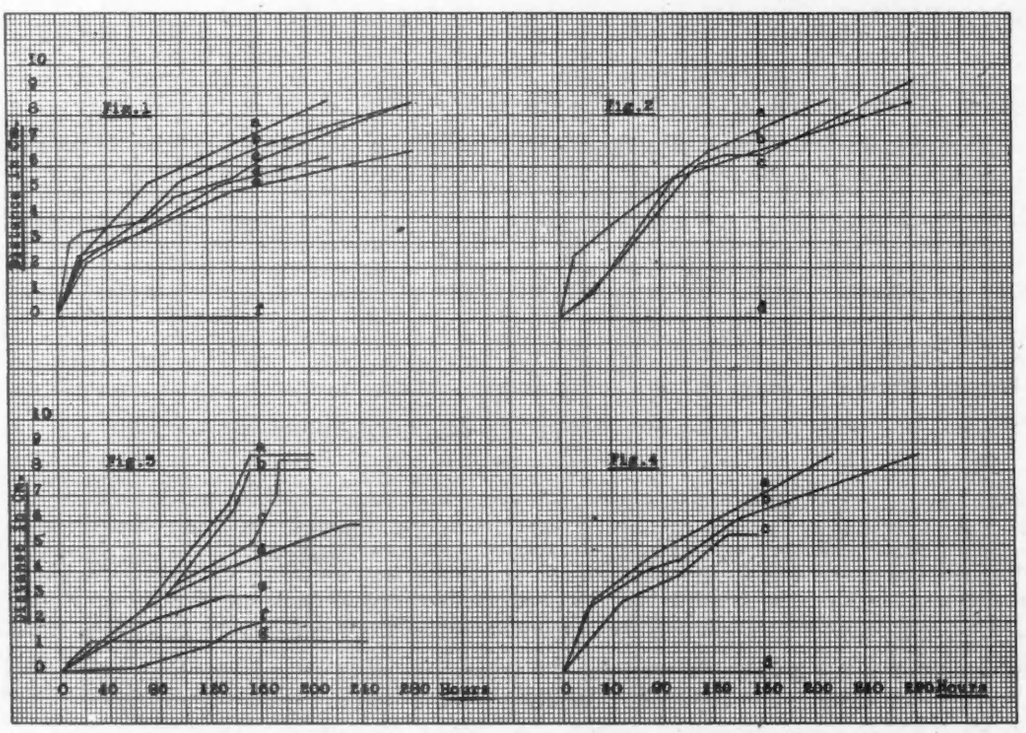

Fig. 1

(*a*) 5% sodium sulfathiazole in 7% P.V.A. (shallow layer).
(*b*) 5% sodium sulfathiazole in 7% P.V.A. (deep layer).
(*c*) 5% sulfathiazole in 7% P.V.A. (deep layer).
(*d*) 5% sulfathiazole in 7% P.V.A. (shallow layer).
(*e*) 5% sulfathiazole and 2½% sodium sulfathiazole in 7% P.V.A.
(*f*) 5% sulfathiazole in paraffin ointment.

Fig. 2

(*a*) 5% sodium sulfathiazole in mucilage of tragacanth (deep layer).
(*b*) 5% sodium sulfathiazole in mucilage of acacia.
(*c*) 5% sodium sulfathiazole in mucilage of tragacanth (shallow layer).
(*d*) 5% sulfathiazole in Ihle's paste (1).

Fig. 3

(*a*) ½% each of sulfanilamide and sulfathiazole in P.V.A.
(*b*) ½% each of sulfanilamide and sulfathiazole in P.V.A.
(*c*) Sulfathiazole powder (deep layer).
(*d*) Light dusting of sulfathiazole.
(*e*) 5% sulfathiazole in lard.
(*f*) 5% sulfathiazole in unguentum simplex.
(*g*) A commercial ointment containing 5% sulfathiazole.

Fig. 4

(*a*) Emulsion containing 5% sulfathiazole (shallow layer) (2).
(*b*) Emulsion containing 5% sulfathiazole (deep layer).
(*c*) 5% sulfathiazole in Ruggle's cream (3).
(*d*) 5% sulfathiazole in adeps lanæ hydrosus.

suggest that the practice of incorporating water-soluble drugs such as the sulfonamides in fatty bases or water-in-oil emulsions should be discontinued. It is quite possible that some clinical results could be obtained from the sulfonamide on the surface of the base in contact with the wound; however, much better results should follow the use of the drug in a water base.

The fact that the thin application delivers at practically the same rate as the thick for at least the first 150 hours is in agreement with the clinical results obtained by dusting thin layers of sulfonamide crystals on wounds. However, the supply of drug finally shows signs of exhaustion. This falling-off is probably not shown when the drug is included in a base because of the technical difficulty in applying it in an equally thin layer.

With a demand for an emulsion of the oil-in-water type for use with water-soluble drugs such as the sulfonamides, it becomes necessary to distinguish this type of emulsion from the other. The difference may quite easily be demonstrated by placing a small portion of the base in water where it diffuses quite readily, imparting to the water a milky appearance. Also, an oil-in-water type of emulsion may be freely diluted with water. In addition, it allows the passage of an electric current and when strained with methylene blue and placed under the microscope, the continuous phase is shown in blue.

Many new water-containing bases have recently been introduced. A number of these are emulsions which have been prepared with the newer emulsifying agents while some are substances which form thick viscid solutions when dissolved in water. It will be some time before these can be properly evaluated. Although the majority are fairly satisfactory from a pharmaceutical standpoint, too little attention is being paid to their possible irritating effects and other pharmacological actions. There is much to be learned concerning their effects upon the formation of granulation tissue, epithelization and their ability to maintain asepsis. In order to keep down infection the base must not only contain an efficient antiseptic but also be capable of delivering it to the tissues; this can take place freely only when the antiseptic can find its way out of the base through a media in which it is soluble. Water-containing bases and the continuous phase of an oil-in-water emulsion supply this media in the case of water-soluble substances.

SUMMARY

1. The rate of diffusion of sulfathiazole out of various bases into agar has been studied.
2. It was found that certain fatty and paraffin bases are unsatisfactory for use with the sulfonamides and that delivery of the latter takes place most readily from water-containing bases.
3. The sodium salt diffuses a little faster than the sulfathiazole itself.
4. Thin layers of the preparations deliver sulfathiazole almost as fast as do thick layers.

We wish to express our thanks to the National Research Council for its support both financial and otherwise in this work.

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RÉSUMÉ

Le taux de diffusion du sulfathiazole varie selon la base à laquelle il est incorporé. Les bases grasses ou paraffinées ne permettent pas une diffusion suffisante; il en est tout autrement avec les bases qui contiennent de l'eau, l'alcool polyvinyl par exemple. Des tracés démontrent le comportement dans les deux cas. Les sels sodiques diffusent à peine un peu plus rapidement que le sulfathiazole pur. Les couches minces agissent aussi bien que les enduis épais. JEAN SAUCIER

The inroads made of recent years into the influence of the traditional link in British medicine—the family doctor and his patient—and the swing towards State medicine are viewed with some apprehension by Sir Beckwith Whitehouse. He admitted to this feeling when addressing the British Medical Association after his induction as president last month. He added that he was convinced that neither the people of this country nor the bulk of the medical profession desired to become the regimented units of a system of bureaucratic control. The British public at heart disliked communal methods of treatment, however efficient they were. Sir Beckwith Whitehouse believes that a system of salaried State medical service would be detrimental to the national health and to the personal interests of patient and doctor alike.—*J. Roy. Inst. of Hyg. & Pub. Health*, 1942, 5: 183.

ON THE EXPECTORANT ACTION OF CREOSOTE AND THE GUAIACOLS*

By Mary E. Stevens, Alice K. Ronan, T. S. Sourkes and Eldon M. Boyd, M.D.

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CREOSOTES and guaiacols have been used as expectorants for approximately one hundred years. They have been included in the leading pharmacopœias and are present in the current editions of the British Pharmacopœia and United States Pharmacopœias. They were accepted into New and Non-Official Remedies for 31 years. In recent years, however, there has been a rising tide of scepticism as to their actual value as expectorants, scepticism evident in several textbooks of pharmacology and materia medica, in clinical usage, and especially in the rejection of such drugs from New and Non-Official Remedies by the Council on Pharmacy and Chemistry of the American Medical Association in 1938.[1]

The reasons for this declining popularity of the guaiacols are partly the lack of experimental proof of any action upon the respiratory tract and partly a lapse of interest. The latter is understandable to students of the history of drugs; many drugs come and go for no apparent reason except perhaps that the practising physician can keep in mind a knowledge of a limited number of drugs only and he naturally employs those drugs which are of contemporary interest and popularity.

Experimental studies on the guaiacols have yielded conflicting data. Fellows[2] concluded after an extensive series of studies that calcium creosotate is not excreted in the bronchial fluids nor in expired air, and that it does not affect the volume, character, or ease of expectoration of sputum in patients with pulmonary tuberculosis. Using a radiological method, Gordonoff and Janett[3] deduced from their observations that creosote and guaiacols decrease the volume of bronchial secretion in man, and Gordonoff,[4] in an extensive review of expectorants, classified these drugs as "secreto-motor" expectorants or drugs which stimulate expulsion but not the production of bronchial secretions. Connell, Johnston and Boyd[5] found that guaiacols increase the water content of the respiratory tract of albino rats, and especially of the trachea, and suggested that their evidence indicated an increased output of respiratory tract fluid. Perry and Boyd[6] demonstrated in the rabbit that guaiacol glycerol ether (resyl) increases the output of the respiratory tract fluid. In the more recent literature from European authors, Peytral,[7] for example, reports a decreased output of sputum in tuberculous patients with the same drug, while the data of Hofmann[8] would suggest an increased output of respiratory tract fluid with this drug given to patients with bronchitis and pneumonia. There are other relevant data of recent origin, but they add little to the confused picture which indicates, at its face value, that under certain conditions guaiacols may decrease the output of respiratory tract fluid, under other circumstances may have no effect, and under a third set of conditions may increase the output.

Whether or not the therapeutic value of these drugs is such as to warrant their extended study is a moot question. However, for some years investigations in this laboratory have been directed toward a study of expectorants and it was decided to examine further the effect of guaiacols upon the output of respiratory tract fluid using the method of Perry and Boyd.[6] This method, briefly, consists in measuring the output of respiratory tract fluid from a tracheal cannula in urethanized animals when the inhaled air is warmed to body temperature and saturated with water vapour. The results obtained indicate that the guaiacols studied do increase the output of respiratory tract fluid in anæsthetized cats and rabbits if the drugs are given in sufficiently large doses. The mechanism of this reaction has been further found to be partly due to a reflex from the stomach and partly to an effect after absorption into the blood stream, possibly upon the brain stem or directly upon the secretory glands of the respiratory tract itself.

EXPERIMENTAL

Guaiacol. — Guaiacol was washed into the stomach of rabbits through a rubber catheter,

* This paper was presented in preliminary form before the Canadian Medical Association at its Annual Meeting in Winnipeg, June, 1941.

using 5 ml. of water per kilo body weight, and control animals received an equivalent volume of water only. The animals were arranged as described above, the output of respiratory tract fluid recorded at half-hourly intervals for a period of 3 hours, then the drug was administered and readings continued for 3 or more hours. The output of respiratory tract fluid at each interval was calculated as ml. per kilo body weight per 24 hours.

A dose of 0.1 ml. of guaiacol per kilo body weight increased the output of respiratory tract fluid in 8 out of 9 rabbits while administration of water alone had no appreciable effect upon the controls (Table I). The increase in output of respiratory tract fluid was not marked, ranging from 20 to 40% of the output before giving the drug. Increasing doses up to 5 ml. per kilo body weight were tried with, in general, slightly greater effects and occasionally marked increases in the output of respiratory tract fluid.

Guaiacol carbonate.—Guaiacol carbonate was given similarly to 8 rabbits in large doses up to 5 grams per kilo body weight. In 7 of the animals given the 5 gram dose there followed an increased output of respiratory tract fluid (Table I), but again the average increase was not marked even with the huge doses used.

Creosote. — Creosote was given by stomach tube to cats in doses of from 0.1 to 5 ml. per kilo body weight. Of 8 cats receiving the 0.1 ml. dose, 6 showed an increased output of respiratory tract fluid, which again was not marked on the average. Larger doses produced greater effects and there were no significant changes in the controls receiving water only.

Guaiacol glycerol ether. — This water-soluble guaiacolate was given to cats and rabbits in doses of from 0.01 to 5 grams per kilo body weight. Of 31 cats receiving the graded doses of the drug, variable results were obtained with doses below 1 gram per kilo, but the 1 gram dose and higher doses consistently increased the output of respiratory tract fluid.

A summary of the data obtained in the more significant experiments upon the above drugs is given in Table I. Redundant data from similar doses or a different species have been omitted, as well as the inconclusive data from small doses of the drugs. The results obtained indicate that these drugs do increase the output of respiratory tract fluid under the conditions of the experiment, but that the increase is not marked and less so than that of other expectorants which have been studied by this method.[6]

Mechanism of action. — Guaiacol carbonate was given to rabbits in which the gastric branches of the vagus nerve had been severed by cutting the œsophagus in two near the stomach and ligating a glass tube into the cut ends. In 5 such rabbits, guaiacol carbonate was given by stomach tube in doses of 5 grm. per kilo body weight. The drug had no effect upon the output of respiratory tract fluid over a period of 4 hours after administration. These results suggest that guaiacol carbonate had previously acted as an expectorant by virtue of a reflex from the stomach by way of the afferent gastric nerves to the medullary centres and then peripherally again to the respiratory tract.

In other experiments evidence was obtained that the guaiacols may also act after absorption into the blood stream, presumably upon the "expectorant centre" in the brain stem or directly upon the cells of the respiratory tract. The water-soluble guaiacolate, guaiacol glycerol

TABLE I.

A summary of the effect of creosote and guaiacols given by stomach tube on the output of respiratory tract fluid in rabbits and cats. The output of respiratory tract fluid is expressed as ml. per kilo body weight per 24 hours.

Drug	*Dose (per kilo)*	*Animals*	*Hourly output of respiratory tract fluid*						
			Before drug			*After drug*			
			1 Hr.	*2 Hrs.*	*3 Hrs.*	*1 Hr.*	*2 Hrs.*	*3 Hrs.*	*4 Hrs.*
Guaiacol	0.1 ml.	9 Rabbits	1.3	2.1	2.2	2.6	2.5	2.9	2.7
Guaiacol	5 ml.	2 Rabbits	1.4	1.8	1.8	3.2			
Guaiacol carbonate	5 grm.	8 Rabbits	1.0	1.9	2.4	2.6	3.4	3.0	3.5
Controls		13 Rabbits	1.2	2.0	2.1	2.4	2.2	2.4	2.3
Creosote	0.1 ml.	8 Cats	0.5	1.9	2.5	2.9	3.1	3.2	2.1
Creosote	5 ml.	1 Cat	1.0	1.6	1.7	3.8			
Guaiacol glycerol ether	1 grm.	5 Cats	1.6	1.8	2.0	2.8	3.5	4.2	
Controls		12 Cats	1.8	2.0	2.4	2.4	2.3	2.4	

ether (resyl), was given by intramuscular injection to a total of 64 cats in doses of from 0 to 0.5 grams per kilo body weight. There were no significant changes in the output of respiratory tract fluid in the controls receiving water only. All of the groups receiving the guaiacolate exhibited an increased output of respiratory tract fluid, an increase which in the case of the higher doses reached as much as 100%. These results suggest that the drug would normally act after absorption into the blood stream as well as through a gastric reflex. There is, of course, the possibility that the intramuscularly injected drug was excreted into the stomach and acted reflexly. From what is known of the metabolism of guaiacols, they are excreted mostly in urine as glycuronates and sulphates,[9] and the same applies to guaiacol glycerol ether.[10] Guaiacol glycerol ether has been occasionally injected intramuscularly in clinical therapy (see, for example, Hofmann[8]).

DISCUSSION

Guaiacol derived its name from guaiac resin from which it was first isolated in 1826 by Unverdorben.[11] It is present in rather small amounts in guaiac resin and probably contributed little to the reputed therapeutic actions of that drug which was brought to Europe in the 16th century from the guaiac trees of San Domingo and Jamaica and was used up to the latter part of the 19th century as a stimulant, diaphoretic, alterative and emmenagogue.[12]

The subsequent history of guaiacol is bound more closely to that of creosote, of which it is the chief constituent. Creosote was isolated in 1830 by Reichenbach who obtained it as one of his products of the destructive distillation of wood. Creosote quickly found its way into the pharmacopœias of London and Edinburgh which, with the Dublin pharmacopœia, were the precursors of the British Pharmacopœia. Thus by 1842, Christison[13] wrote that "creosote has become an important article of the materia medica". The claims put forward at that time for this (then) new drug remind one of the variegated claims put forward for many new drugs today — apparently this custom has not changed! Thus creosote was stated to be an irritant, a styptic, a narcotic, a sedative, an anodyne, an antiseptic, a diuretic, and to be useful for ulcers, burns, conjunctivitis, gonorrhœa, leprosy, psoriasis, toothache, cholera, hæmoptysis, phthisis, menorrhagia and bronchitis![13] Christison also noted that, "An old German nostrum for chronic diseases of the chest, called Aqua Binelli, seems to contain creosote for its only active ingredient." Creosote was taken internally 100 years ago for many of the above conditions in doses of 1 or 2 drops dispensed as Mistura creazoti, Ed. Ph., which was a syrupy mixture.

Out of this initial multitude of indications for the use of creosote, the field for internal therapeutics gradually became limited to its use as an expectorant in chronic bronchitis, bronchiectasis, and especially in pulmonary tuberculosis. At this point a complicating factor was introduced in that some authors postulated, upon theoretical reasoning, that creosote had an antiseptic action toward the tubercle bacilli in the lung. This idea has been promulgated through many decades and is occasionally referred to even today. The idea lacks proof, and this has been repeatedly pointed out for half a century. Thus in 1909 Stevens[14] wrote: "So long ago as Addison's time, creosote was used as a remedy for phthisis. This use was revived by Bouchard and Gembert in 1877, and again by Sommerbrodt in 1887. While it has been shown conclusively that the drug has no specific influence on the tubercle bacilli in the lung, nevertheless the testimony of many observers is convincing that it has a positive value in allaying cough, lessening expectoration and lowering temperature."

About the beginning of the 20th century, a large number of derivatives of creosote appeared on the market, mostly from the various pharmaceutical companies which were then becoming large and acquiring increasing influence. These newer derivatives included creosote carbonate, guaiacol, guaiacol carbonate, guaiacol potassium sulphonate (*e.g.* thiocol), guaiacol benzoate (*e.g.* benzosol), guaiacol phosphite, guaiacol cinnamate (*e.g.* styracol), guaiacol glycerol ether (*e.g.* guaiamar, resyl), etc. The chief advantage claimed for these drugs over guaiacol and creosote was that they were less irritating to the gastrointestinal tract. In many instances, however, the advertising literature extravagantly extended the claims for therapeutic usefulness, and as these claims were gradually found to be without foundation of fact, a scepticism arose in the minds of physicians as to the value of these drugs under any circumstances.

This has been the evolution of creosote and

guaiacol as drugs for internal use. Contemporary literature, already reviewed in the introduction, has offered conflicting evidence as to their mode of action and therapeutic value. The experiments described in this communication indicate that these drugs, if given in large doses to anæsthetized cats and rabbits, will increase the output of respiratory tract fluid through a gastric reflex and also after absorption. The increased output of respiratory tract fluid is reasonably consistent but seldom marked on the average. In view of the large doses used, it is questionable if these data on animals could be applied to man. On the other hand it is quite possible that the anæsthetized animal requires more of a drug than an unanæsthetized animal to produce the effect recorded.

In an effort to evaluate quantitatively the effect of guaiacols in the therapy of cough in man, a group of medical students was given guaiacol glycerol ether in tablet form and at a dose of 1.2 grm. per day. Another group received placebo tablets containing no guaiacolate but otherwise the same as those tablets given the first group. The students were unaware of what tablets they received and no selection was made in the distribution of tablets. Each man was asked to record as accurately as possible the number of coughs which he had per day whenever he acquired a cold and these data were recorded weekly by one of us while the students were in the pharmacological laboratory. The experiment was carried out through one winter season, from October to April. At the completion of the experiment it was found that a total of 58 colds had been treated with the placebo tablets and that the average number of coughs per day in this group was 48.4. There were 48 colds treated with guaiacol glycerol ether and the average number of coughs per day in this group was 13.6. The mean difference of 34.8 was found to have a standard deviation of 6.4 which indicated that the results could not have been due purely to chance. These data indicate that the guaiacolate had a sedative effect upon cough, probably, in view of the animal experiments, due to an increased output of respiratory tract fluid.

SUMMARY

Creosote, guaiacol, guaiacol carbonate and guaiacol glycerol ether were found to increase the output of respiratory tract fluid when given by stomach tube to cats and rabbits in doses up to 5 grm. or c.c. per kilo body weight. While the increased output occurred with reasonable consistency, the average output was seldom increased more than 50% over 4 hours or so.

Evidence was obtained that these drugs act (*a*) by a reflex from the stomach and (*b*) after absorption into the blood stream.

Guaiacol glycerol ether given in daily doses of 1.2 grm. to medical students significantly reduced the number of coughs per day during colds from the number occurring in other medical students receiving a placebo in a "blind test".

The historical evolution of creosote and guaiacol as drugs is discussed.

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Under a new sanitary regulation it is now compulsory in Puerto Rico for all government employees, teachers, officials, and employees of universities, colleges, and public and private schools, and pupils over 13 years of age in public and private schools to have physical examinations, including x-rays of the chest, at least once every two years, or oftener if the commissioner of health considers it to be necessary. Persons refusing to submit to examination are removed from their positions and children suspended from class attendance until they comply with the regulations. Any individual found to be suffering from active pulmonary tuberculosis is excluded from his place of employment or educational establishment until no longer considered a menace to the health of others.—*J. Roy. Inst. Pub. Health & Hygiene*, 1942, **5**: 163.

EXFOLIATIVE DERMATITIS

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EXFOLIATIVE dermatitis, to judge from the literature, seems to be one of the diseases about which very little is known as to cause or adequate treatment. The following is a list of causes recently given by one writer: toxæmias, gout, rheumatism, tuberculosis, chronic alcoholism, climatic influences, the local use of hydrargyrum, chrysarobin, arnica, the internal use of quinine, arsenic, antipyrin, and antitoxic sera.

A multiplicity of forms of treatments have been suggested without their being based on any particular idea or theory. As to just what is the nature of this disease, J. W. Auld[1] describes two cases, one due to lead and tar, and the other to toxic bacterial proteins. He mentions that "in the consideration of dermatological diseases, we must give consideration to allergy".

It has seemed to the writer for a number of years that exfoliative dermatitis is merely an allergic reaction, in which the shock organ is practically the entire skin and not just part of it. In the following four cases treatment was based on this theory and in each of the four the skin condition definitely improved as soon as this course was followed.

CASE 1

The patient was admitted on May 1, with the whole body surface affected with a scaling inflammatory condition, diagnosed by the attending physician as exfoliative dermatitis. Under palliative treatment there was some improvement so that he left hospital on June 26. On July 16, he was readmitted. Many forms of treatment were employed during the following months: local applications, radiation, wheat- and egg-free diets, etc.

On February 24, the writer first saw the case in consultation and suggested that the patient be treated as though he were allergic, probably to some article of food, and it was urged that the following five specific things should be carried out concurrently. (1) Calcium (Sandoz) 10 c.c. intravenously, daily for four or five days, then less frequently. (2) Hydrochloric acid dil. ½ dram t.i.d. (3) Panteric tablets—2—1 hour p.c. (4) Elimination diets (Rowe). (5) Auto-hæmotherapy.

This line of treatment was begun on March 8, the diet for the first few days being limited strictly to milk. The improvement in the skin condition was definite within a few days, and in a little over a week, the nurses commented on the fact that they no longer had to sweep up scales from the floor. By March 21 the skin was practically free of desquamation, but some itchy areas required soothing ointments. Unfortunately, during this course of treatment the patient was moved to another building outside of the hospital. On March 13 his temperature rose to 101° and he had a slight cough. His condition seemed better five days later, but on March 23, he developed pneumonia and died on March 27. (It seems to be an open question whether the reason that a number of patients suffering from exfoliative dermatitis die of pneumonia is because there is a relation between the two diseases, or because of the long period of bed rest so frequently prescribed, just as in the case of a fractured hip).

CASE 2

A painter, aged 50 years. Had lues thirty years ago, apparently cured. Two years ago a scaly rash appeared on legs, arms, chest and back. He was given arsenicals, and the rash cleared up. Wassermann and Kahn tests were negative.

In December a similar rash developed. Two treatments with arsenic were followed by a swelling of the eyes and face. Physical examination and various laboratory tests were negative, various lines of study and treatment afforded no improvement. On March 5, the author was called in on consultation. The following day treatment was begun along lines already suggested in Case 1. Liquid petrolatum was the only local treatment used, and some sedatives were given for sleep. By March 15, the nurse's record stated "patient much brighter".

April 1.—The report stated "seems to be gradual improvement". Improvement was steady and on June 29 the patient was discharged, and came to the outpatient department. The patient, by this time, was on a fairly full diet. He continued to improve with one or two slight local outbreaks of a rash which would ordinarily be called eczema unless one knew his history. When seen recently he was in excellent health and his skin absolutely normal.

CASE 3

E.D., aged 69. Gave a history of having had "eczema" intermittently since the age of 17. It had been worse the last year and was very itchy. Soothing applications, intravenous calcium, and other various treatments gave little improvement over a period of five months. At that time (May 31) there was a desquamatory rash on his cheeks, scalp, behind the ears, on arms, hands, and legs. Laboratory tests were essentially negative. Slight improvement seemed to follow the use of more calcium intravenously and elimination diets. On June 29, the patient developed pneumonia (later reported by the laboratory as Type III pneumococcus). The patient recovered from the pneumonia, taking about a month to convalesce. It is interesting to note that the skin condition improved greatly while he had pneumonia. For the time being he seemed cured.

On September 19, the patient returned to the outpatient clinic, complaining of a slight recurrence. Local applications and dieting at home and auto-hæmotherapy produced little if any improvement in his condition over a period of months. On March 27, he developed a crop of pustules on his hands, and laboratory examination showed "diplococci morphologically resembling pneumococci". On April 27 a course of sulfapyridine was begun. This was followed by some definite improvement. Within a week the severity and area of exfoliation and inflammation had decreased. On May 22, and at weekly intervals following, a course of mixed stock vaccine was given, which included pneumococcus and several varieties each of streptococcus and staphylococcus. Steady improvement in the patient's condition was noted throughout June and July.

During the first half of September a severe derma-

titis occurred on the arms and legs. A course of the vaccine, above mentioned, begun early in November, was followed almost immediately by improvement. By December 11 the dermatitis was definitely improved, but the patient seemed to be very nervous and worried about himself. He was urged to omit milk from his diet. On January 17 the patient was seen at home. He was very morose and discouraged about his health. The skin appeared entirely normal, but he imagined it was much worse. Relatives were advised that the major problem was now insanity, and shortly afterwards the patient suicided.

CASE 4

W.M., aged 4. This patient was brought to our clinic from a considerable distance, and was able to attend only at comparatively rare intervals. He had an acute dry eczematous, scaly rash over most of his body for about one month. The skin was red and thickened. His eyelids were puffy and inflamed. He had been eating very considerable quantities of eggs and oatmeal for some weeks before the rash developed, and since these were omitted from the diet (on advice of his local doctor) there had been a slight improvement. His mental condition seemed somewhat sluggish. His parents were advised to remove eggs *absolutely* from the diet, including all substances which might contain eggs. Soothing applications and calcium gluconate, 5 grains three times a day by mouth were given. Improvement was noticed in one week and definite in two weeks. Thyroid (½ grain twice a day) was added to the treatment. Improvement was steady, and after four months there was no flaking. Two and a half months later, having been without medicines for some time, the face was still slightly inflamed. Treatment was resumed, and approximately one year after he was first seen, the child's condition was practically normal and has remained so. (He probably could have been cured more quickly could he have been seen oftener.)

SUMMARY

Four cases of exfoliative dermatitis are briefly described. All four showed marked improvement when treated as allergic manifestation. Workers who see larger numbers of cases should study this disease with a view to including it in the group of allergic phenomena.

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MORTALITY AND MORBIDITY FOLLOWING OPERATIONS IN A GENERAL HOSPITAL*

BY D. C. AIKENHEAD, M.D. AND EVELYN GAMBLE

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STATISTICAL information may be compiled to prove or disprove a wide variety of subjects. The comparison of such compiled statistics with similar material some thousand miles away may or may not be in order. For example, the technique of anæsthesia is fairly well standardized in the larger hospitals throughout the continent. The variables of surgical technique, climate, and environment may alter the end results of surgical operations. To date, we have no yard stick to measure post operative morbidity. What might be looked upon as a mild atelectasis of the lung in Vancouver by one surgeon could in the Middle West or East, conceivably, be called a postoperative reaction from the absorption of traumatized tissue. With these variables and the lack of a standard of comparison of post-operative morbidity, the comparison of surgical end results from hospitals with a wide geographic separation has only a relative value.

The following is a report of 7,367 anæsthetics administered at the Winnipeg General Hospital in a twelve-month period commencing May 1, 1941. Breaking these up into groups we have 4,774 anæsthetics in general surgery, 1,522 in the Eye, Ear, Nose and Throat Section, and 1,071 in maternity. The anæsthetic agents used were as follows:

Ether	3,620
Mixed ether and chloroform (maternity and E., E., N. & T.)	1.047
Cyclopropane	1,143
Ethylene	32
Nitrous oxide and oxygen	25
"Spinal"	1,264
Avertin	103
Pentothal	101
Chloroform	32

(Electro-surgery of the tongue, at the surgeon's request).

From east to west Winnipeg is roughly the centre of the continent and slightly north of centre from north to south. The winters are long, with the air dry and cold. During the cold weather Winnipeg indoors is probably the warmest spot in the country. Most homes and apartment blocks during waking hours run from 72 to 76° F. and often higher. One's nasal mucosa has to be somewhat of a chameleon when stepping from a house of 76° F. to an out-of-doors at –20° F. Sinus trouble is therefore well nigh universal in adults in Winnipeg. Acute sinusitis is relatively frequent. Inhala-

* Read at the Seventy-third Annual Meeting of the Canadian Medical Association, Jasper Park, June, 1942.

tion anæsthesia does not apparently light up these chronic sinuses. We have a great many patients suffering from goitre. Whether these goitres are caused by some diet deficiency or to distance inland or a combination of both factors we cannot state. Food conditions are good even in the lower income groups. We import and consume during the non-growing season relatively large quantities per capita of citrus fruits, tomatoes, lettuce, celery, etc. Basic foods such as meat, milk, bread, and the common vegetables are widely used.

We have at the Winnipeg General Hospital an anæsthetic staff of five medical graduates, with one undergraduate who changes each month. As usual, we have more operating rooms than anæsthetists, but on looking around in other cities we find we have one advantage over many of them in that we have all our operating theatres in one building. Each theatre is equipped with an efficient live steam jet which provides adequate humidification during the coldest weather. A "wet and dry" thermometer on the wall of each operating room with the wick in proper condition records humidity.

Where cyclopropane is used as an anæsthetic agent we maintain a humidity of 55 to 65%. Some of our surgeons are not enthusiastic over high humidity but we ask them to suffer in silence. We consider a humidity of 60% to be a major factor in the prevention of static electricity. We have used cyclopropane many thousands of times without accident, but in all humility we must acknowledge that this is due to good luck rather than anything else. All electric switches in the operating room are of the mercury contact type. We try to keep abreast of the recommendations as outlined by the Fire Underwriters Association for the prevention of fire hazard in the operating room.

Most of our operating is done between the hours of 8 a.m. and 1 p.m. On the evening previous the resident anæsthetist prepares a chart while making rounds of the patients who are to be operated upon the following morning. This chart is hung in one of the anæsthetic rooms where each anæsthetist can get data upon his or her patient. This chart gives the patient's name, age, weight, premedication, systolic and diastolic blood pressure, hæmoglobin, proposed operation, the surgeon, and any pertinent facts such as, previous operation, diabetes, preference for inhalation, etc.

TABLE I.

TYPES AND NUMBERS OF OPERATIONS

Type of operation	*Total number of operations*	*Morbidity*	*Mortality*	*Percentage of mortality*
Craniotomy	34	3	7	20.5
Ventriculogram	16	1	2	12.5
Laparotomy	95	8	9	9.4 (6 inoperable cases)
Biliary system	173	11	9	5.2
Gastroenterostomy	39	5	4	10.2
Gastric resection	52	4	2	3.8
Perforated peptic ulcer	20	2	0	0
Abdominal perineal	15	2	1	6.6
Intestinal	114	8	11	9.64
Appendectomy	627	11	2	0.31
Hysterectomy	131	2	0	0
Cæsarean Section (classical)	37	0	0	0
Splenectomy	5	1	2	40.0
Ectopic	10	0	0	0
Thyroidectomy	364	5	3	.82
Trans-urethral resection	252	8	8	3.1
Sympathectomy	16	1	2	12.5
Nephrectomy	29	2	1	4.1
Lobectomy	4	0	1	25.0
Halstead	40	0	0	0
Herniæ	300	8	0	0
Miscellaneous	2,401	57	22	.91
Total operations.	4,774	139	86	1.80

The total mortality following 7,367 anæsthetics was 88, or a percentage of 1.06. This includes general surgery, E., E.N. & T., and maternity.

TABLE II.

Total anæsthetic agents used during the year excluding local infiltration anæsthesia.

Chloroform and ether mixture (Maternity and E.E.N. & T.)	1,047
Ether	3,620
Cyclopropane	1,143
Ethylene	32
Nitrous oxide and oxygen	25
Chloroform (Diathermy about the face)	32
Pentothal	101
Avertin	103
"Spinal" (subarachnoid block)	1,264
	7,367

TABLE III.

Mortality following the various anæsthetic agents used during the year excluding "local" infiltration anæsthesia.

	Number of deaths	*Percentage*	*Number of operations*
Ether	32	0.88	3,620
Cyclopropane	20	1.77	1,143
"Spinal"	26	2.2	1,264
Avertin	7	6.7	103
Pentothal	3	3.0	98

It might be said that pentothal was combined with other agents with the three deaths and that 3% is not a fair statement of mortality for pentothal.

The choice of the anæsthetic agent is finally determined in discussion with the surgeon. As a rule, difficult surgical cases are in the hospital several days previous to operation. A senior anæsthetist checks these patients and later discusses with the surgeon the choice of a suitable anæsthetic agent (Table II and III).

We use all the accepted anæsthetic agents. We have no hard and fast rule in the use of one agent for one type of operation. For heavy muscular patients, who are to undergo abdominal operations we prefer spinal. Moral suasion is used to convince the patient of the wisdom of this choice. Most gynæcological surgery is done under inhalation anæsthesia. We do a moderate amount of neuro-surgery. We use avertin as a basal anæsthetic, and the surgeon uses infiltration at the operative site. Trans-urethral resection of the prostate is done under spinal anæsthesia. The majority of these patients suffer from some form of respiratory, circulatory or renal trouble. Many have defects in all three systems. To allow the surgeon sufficient time for his resection we use 50 to 100 mgm. of novocain dissolved in 1.5 c.c. of spinal fluid at the level of the fourth and fifth lumbar. The smaller dose causes less systemic disturbance in the patient, but is not sufficient for a lengthy resection. The larger quantity occasionally causes a considerable drop in blood pressure. Hence the anæsthetist has to steer between the Scylla of under-dosage and the Charybdis of too much.

The use of a B.L.W. nasal mask or the rubber nasal tubes (Heidbrink), as used by dentists in analgesia is an efficient way to give oxygen during the operation. Patients who breathe pure oxygen have the oxygen content of the blood serum raised from ½ to 2%. The general well-being of the patient is much greater than the increase of blood serum oxygen would suggest. We use oxygen with a nasal mask with most trans-urethral prostatic resections. A sudden drop in blood pressure during the operation requires 15 to 40 mgm. of intravenous ephedrine sulphate and, if necessary, 300 to 500 c.c. of 0.9% saline intravenously, given slowly. Within a few minutes the blood pressure is close to the preoperative level. Obese short-necked patients requiring abdominal work are operated on under intratracheal ether. We try to have these patients anæsthetized at least fifteen minutes before the surgeon makes the incision. It might be said that this ambition is not always realized.

We believe a combination of anæsthetic agents in a long difficult operation to be less burdensome to the patient than the use of one agent. We have no mortality figures to substantiate this statement, but the anæsthetists are convinced that this is a fact. A gastric resection with the first two hours under nupercaine anæsthesia and the last forty-five minutes under cyclopropane will finish up better than in the case of a patient who receives at one dose sufficient nupercaine for 165 minutes of anæsthesia. We are using continuous spinal anæsthesia, but to date the number of operations is so limited that we cannot make a statement of its value.

Many patients get very tired under subarachnoid block upon the operating table for long periods, even though they may have no pain. The use of intravenous morphine during the operation helps to allay this discomfort. We do not give morphine intravenously while the surgeon has gastric suturing to do. The drug causes increased gastric motility and interferes with the procedure.

We find cyclopropane an excellent anæsthetic agent to allay the restlessness of a patient under spinal or to supplement a spinal anæsthetic which is receding. We are enthusiastic over the use of cyclopropane as an inhalation agent. We use it a great deal, particularly in thyroid cases. As previously mentioned, fire hazards are kept in mind.

The anæsthetist keeps a chart during the operation showing perspiration, pulse, systolic and diastolic blood pressure. Of 4,774 anæsthetics in general surgery, charts were made of 2,986 operations.

We use intravenous fluids during an operation. Patients undergoing gastric resections, exploration of the common bile ducts, craniotomies, receive intravenous fluids and a high percentage get blood. Care must be exercised in not allowing the fluid to run too fast, and in patients past middle age, not to over-burden the circulation with quantity.

Most patients who are very ill or having had long operations are returned from the operating room to the ward in their beds. We believe this to be an important point in the handling of patients under spinal anæsthesia for upper abdominal surgery. These patients have a lower intercostal paralysis with anæsthesia of the ab-

dominal sympathetic. The latter leads to engorgement of the abdominal vessels and lack of vascular contraction. It will readily be seen that the less these patients are moved the less disturbance there will be to their vaso-motor system. In hospitals where it is not practicable to bring the bed to the operating room, having a ward close to the operating room for the post-operative care of patients under high spinal anæsthesia might be considered.

A few words in regard to muscular relaxation during abdominal operations. We all know that the average anæsthetist can get satisfactory muscular relaxation to allow the surgeon to do his work in comfort. There are the odd cases where, despite all the anæsthetist's wiles, the surgeon feels the abdominal relaxation is far from perfect. After such a case, may I suggest the perusal by my surgeon friend of "Relaxation: A Meditative Essay" by Dr. N. E. Gillespie in *Anæsthesiology,* November, 1940. To quote from this article "Personal friendship between surgeon and anæsthetist is probably the greatest help in realizing these ideals". In looking over a year's work in anæsthesia one cannot pick out one agent and say "This is agent No. 1". "Statistically, all agents are alike" according to Lyford (*Arch. of Surg.,* Jan., 1942) and with this statement we are inclined to agree.

Low incidence of morbidity and mortality following general surgery would seem to come the hard way. No one spectacular change will bring the desired end. The following points would seem to be of value.

Preoperative.—Careful physical examination; fluid balance including blood; a few extra days in hospital for heavy cases.

In the operating room.—Use one or more anæsthetic agents; generous use of intravenous fluids and blood to return the patient to the ward with a systolic pressure close to normal. "Team play" between the surgeon and the anæsthetist; heavy surgical cases returned to the ward in their beds.

Postoperative. — Cautious use of powerful sedatives. Early use of "nasal suction" in abdominal surgery. Inhalation of pure carbon dioxide, 30 seconds, t.i.d., for two days. Intravenous fluids, including blood, keeping in mind fluids should not be given as a routine.

SECOND YEAR ANÆMIAS*

BY EDMUND CAIRNS, M.D.

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IT would be impossible in a short paper to discuss in detail all of the different types of anæmia that may occur during the second year of life. Rather, it is the intention in this paper to discuss in some detail the anæmias that are seen most commonly in this age-period, and merely to mention the less common types. There is not, to my knowledge, any "typical" anæmia of the second year, in the sense that congenital anæmia and anæmia of prematurity belong typically to the first year of life.

Probably the most common type of anæmia noted in the 12- to 24-month period is the so-called "nutritional anæmia". Even it has its origin in the majority of cases in the latter half of the first year. This simple anæmia has been variously named, "milk anæmia", "alimentary anæmia", etc. Probably the most descriptive name for the anæmias due to dietary lack is that suggested by Cooley,[1] *viz.*: "deficiency anæmias". A great deal has been written as to the cause of nutritional anæmia. Some investigators insist that it is purely an iron deficiency. Others blame some unknown constitutional factor. By others the onus is placed on the vitamins. In all probability the real cause lies in a combination of several factors. Regardless of the actual underlying causes of nutritional anæmia, suffice it to say that it does occur, and fairly frequently. Rittershofer,[2] of Cincinnati, reporting a study of the blood of 2,521 children ranging from birth to seventeen years, stated that, in the age-group of 6 months to 2 years 50% of the children showed the need of iron therapy. Similarly, Fullerton,[3] of Glasgow, found that 87% of 298 poor-class infants between 9 and 23 months had subnormal hæmoglobin levels (less

* Read at the Seventy-third Annual Meeting of the Canadian Medical Association, Jasper Park, Alberta, June, 1942.

than 80% Haldane). The most conspicuous and generally recognized example of nutritional anæmia is that which results from the overlong use of milk, without the addition of other foods. The writer has seen several of these cases with hæmoglobins ranging from 50% down to as low as 12%.

Another type of nutritional anæmia seen fairly frequently is what Cooley terms "alimentary infectious anæmia". In this type there is probably a latent alimentary anæmia which is brought to light by a superimposed infection. In these cases a vicious cycle soon results, the anæmia lessens the resistance to infection, and the infection increases the anæmia.

Clinically, a purely nutritional anæmia may develop insidiously and may be overlooked until the waxy-white pallor is well pronounced. If infection plays a part the anæmia may develop very suddenly. In either case the general symptoms are much the same; pallor, lassitude, hypotonia, anorexia, and often vomiting. Cardiac dilatation with a systolic murmur is common in the more prolonged cases. Slight enlargement of the superficial lymph glands is fairly common and a palpable spleen may be found. The blood in the simple nutritional anæmia shows a hypochromia of varying degree, with little or no lowering of the red cell count. Evidence of regeneration, such as the finding of normoblasts or reticulocytes, is slight; some microcytosis is fairly common, but variation in shape of the erythrocytes is rare. The white cells are little affected. In the alimentary infectious type more variety is found in the blood picture. The red-cell count is lower and the hypochromia often not as pronounced. Signs of regeneration are more common and more marked in this form. The leucocyte count is usually increased and may be so to a marked degree. It is in this form of anæmia that the so-called von Jaksch syndrome may be observed.

The simple nutritional anæmias found in multiple or premature births usually respond to large doses of iron. In some clinics liver extract and iron find more favour than iron alone. In the more complicated anæmias iron and liver extract give better results than iron alone. In some cases transfusion is indispensable, especially where infection is a factor. In the latter cases iron is ineffective. Needless to say, the diet should be properly regulated. It is often found that the giving of a more varied diet is in itself sufficient to correct the anæmia. Of the iron preparations Ferri et Ammon. Cit. is still one of the favourites (10 to 15 gr. t.i.d.). In some clinics the ferrous salts are more popular (2 to 3 gr. t.i.d.). The giving of liver along with iron seems to have a beneficial effect. Often better results are obtained with smaller doses of iron combined with liver than with massive doses of iron alone. The exact action of liver is not known. It has been suggested that liver may act through its copper content which itself is thought to act as a catalyst in the formation of hæmoglobin. The need of the addition of copper to the iron preparations is still causing much controversy. Some groups feel that they obtain better results if small doses of copper are added, while others maintain that in their experience copper has had no effect.

Infections are important in discussing anæmias of the second year. Infection may cause anæmia either by producing, presumably through its toxins, a hypoplastic or even a definite aplastic state, or it may be the cause of pathological cell destruction. Most infections are likely to cause some red cell hypoplasia, with a resulting slight or moderate anæmia. Severe anæmia, secondary to the common infections, such as measles, tonsillitis, pneumonia, is not a common finding. Of the chronic infections syphilis and tuberculosis may cause anæmic states, while of the acute infections, sepsis, pyelitis, and typhoid fever are outstanding.

Pneumococcus infections do not as a rule cause marked anæmia unless suppuration occurs, while the streptococci and hæmolytic staphylococci may be the cause of grave anæmias. Typhoid usually causes a definite hypoplasia which may be prolonged. Pertussis may be followed by a marked hypoplasia or even an aplastic state. The blood picture in anæmia due to infection varies from the more common mild hypoplasia affecting mainly the erythrocytes to an aplastic state affecting both red and white cells and even, in some instances, the platelets.

Since medicinal treatment during acute infections has little or no effect, if the anæmia is marked transfusion is definitely indicated. Treatment of the primary infection and removal of chronic foci are important. Even after the acute infection has subsided the hypoplastic state may persist. Here again transfusion may hasten convalescence. Adequate diet, liver and iron in large doses should be

given and the importance of fresh air and sunshine remembered.

During recent years, reports of a severe anæmia, hæmolytic in type, which is thought to be due to infection, have appeared in the literature. This acute hæmolytic anæmia is characterized by fever, marked toxæmia and prostration followed by a rapidly progressing anæmia, splenomegaly and intense jaundice. The blood picture shows marked increase in granulocytes with extreme destruction of the red cells by fragmentation. There are pronounced anisocytosis and poikilocytosis and signs of regeneration in the form of normoblasts, macrocytes and increased reticulated cells. In the relatively few cases reported transfusion appears to be the treatment of choice, recovery being much more prompt than when the usual anti-anæmic therapy is used.

There are several other uncommon anæmias which may be diagnosed during the second year. The first of these is aplastic anæmia, which is divided into primary and secondary types. Primary aplastic anæmia is rare at any age, and especially in childhood. The outstanding features of this disease are a profound progressive anæmia, little or no splenomegaly, a marked tendency to obstinate bleeding, and a fatal outcome. The blood picture is one of great diminution of all the formed elements of the blood without signs of regeneration. Treatment is of no avail, although transfusions may prolong the issue.

Secondary aplastic states are more common than the primary forms and present a more varied picture, as the whole bone marrow may not be involved. Sepsis may produce an aplastic state with fever, petechiæ, leukopenia, low platelet count and fatal outcome. Another group, termed post-infectious marrow atrophy, is described. Cooley reports two such cases following whooping cough. Even a seemingly trivial infection may be followed by some degree of aplasia. Aleukæmic leukæmia produces a pronounced aplastic picture and clinically it is often impossible to differentiate it from aplastic anæmia. Aplastic states may result from too extensive x-ray treatment or from arsphenamine or benzol. In these instances recovery may occur if the marrow is not too badly damaged. In fully developed aplastic states the prognosis is invariably hopeless. The exceptions are the septic and toxic states in which the marrow destruction is not complete and the cause can be removed in time for regeneration to take place.

There is another group of anæmias which are often grouped together as the constitutional hæmolytic anæmias. These are hæmolytic icterus, sickle-cell anæmia, erythroblastic anæmia, and pernicious anæmia. With the exception of pernicious anæmia, all of these have been observed as early as the second year. These four anæmias have several features in common, namely, a tendency to be familial, hyperplasia of the erythropoietic marrow, production of defective red cells, increase in reticulated cells, and excessive destruction of erythrocytes with increased pigmentation of the plasma and tendency to jaundice of the acholuric type. This group will be discussed very briefly.

Hæmolytic icterus may be congenital or acquired. Clinically, the differences are only slight, both have been observed in early childhood. The outstanding features of hæmolytic icterus clinically are acholuric jaundice, anæmia, splenomegaly, and in some cases "hæmolytic crises". The important blood findings consist of microcytosis, reduced resistance of the red cells to hæmolysis by hypotonic solutions, and great increase in the percentage of reticulocytes. Treatment, which is splenectomy in selected cases, need not concern us in discussing anæmias of the second year.

Sickle-cell anæmia occurs largely in negro children but has been reported in the Mediterranean races. It is essentially a disease of the early years. Clinically, it is characterized by anæmia, moderate jaundice, splenomegaly, and in many cases by crises of pain in the abdomen and extremities. The striking feature in the blood examination is the bizarre "sickling" of the red cells seen mainly in sealed moist films after a few hours standing. Increased marrow activity is shown by the presence of young immature red cells, while bilirubinæmia and urobilinuria are evidence of abnormal destruction. Although the "sickling" tendency is hereditary, sickle-cell anæmia is often undiagnosed until the clinical picture is accentuated by an infection. Moist blood smears are necessary to confirm the diagnosis. The usual anæmia shows a red count of around 2,500,000. The heart is invariably dilated, and shows a functional murmur. Abdominal crises are fairly common and may easily be confused with a surgical condition. Severe pain in the joints are less common than abdominal crises. The spleen is invariably enlarged, especially during hæmolytic crises.

Radiologically, the skull may show peculiar striations but not to the extent seen in erythroblastic anæmia.

The prognosis is usually given as poor because of the likelihood of intercurrent infection, but some investigators, notably Cooley, believe there is a tendency to spontaneous recovery. Treatment is directed toward combating the anæmia and preventing infection by removal of foci.

Erythroblastic anæmia is defined as a grave progressive anæmia of macrocytic type confined to children of the northern Mediterranean races. It is congenital and often familial. Clinically the chief characteristics are the anæmia, great splenomegaly, less liver enlargement, and radiological evidence of extreme marrow hyperplasia, with thinning of the cortex of all bones, especially the skull. The striking blood change is the outpouring of great numbers of young imperfect red cells which disintegrate rapidly, giving signs of hæmolysis such as urobilinuria, pigmented serum and subicteric jaundice. The disease usually progresses to a fatal termination within months or a few years. The diagnosis of erythroblastic anæmia may be made in early infancy and by the second year the condition is usually well pronounced. The course of the disease is progressive, very few children reaching puberty and fewer, adulthood. The progressive enlargement of the spleen and liver is a prominent feature. The anæmia gradually becomes more severe and the red cell count may drop to under 1,000,000. There is a leucocytosis. The x-ray findings in the well developed case are very striking. Thinning of the cortex of the bones is prominent, with trabeculation, especially towards the ends of the diaphyses. Changes in the skull are not marked until after months or years of anæmia. At first the bones of the vault seem thickened and porous. Later the malar bones take part in the thickening process giving rise to a mongoloid facies which is often pronounced. Still later a very striking picture may be found in the form of bony spicules extending up from the inner table. Since the outer table is by this time very thin the spicules have the appearance of bristly hairs attached to the inner table. Treatment is purely palliative, transfusion being used for the severe anæmia and splenectomy is sometimes done to relieve the child of the burden of carrying around a huge spleen.

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Case Reports

OBSTRUCTIVE GOITRE IN A DEAF MUTE

BY JAMES B. MCCLINTON, M.B., B.SC.MED.

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Physiological goitre in children is not uncommon. Congenital enlargement occurs rarely. One per cent of all goitres are toxic. Colloid adenoma large enough to obstruct the trachea is strikingly rare. Holt states "It practically never produces any pressure symptoms".

Of 86,226 admissions to the Hospital for Sick Children, Toronto, in one decade, there were ten cases of goitre and one operation. Discussing obstructive non-toxic goitre in children Dr. D. E. Robertson, Chief Surgeon of that Institution writes "Of that type, within my memory, we have had none".

A case of obstructive colloid adenoma in a deaf mute therefore merits notice.

CASE REPORT

A boy was referred home from a school for the deaf on account of difficult breathing and a lump in his neck.

The child, aged 12, weight 64 lbs., was nervous and frightened. His hearing was negligible. He could speak two words. His strangling, whistling breathing could be heard thirty yards away. An enlargement presented in the midline of the neck. It projected two inches above the sternum and displaced the left sternocleidomastoid.

A basal metabolism test was not practicable. There was no heat intolerance. The child had an inferiority complex and was frightened.

Lateral x-ray revealed a pear-shaped mass pinching off the trachea.

Under general anæsthesia, with low collar incision, I removed an encapsulated adenoma three inches in diameter. It occupied the isthmus. A spur arose beneath the left sternocleidomastoid. The lateral lobes appeared normal and were not disturbed. The trachea was flattened at the site of the tumour. Pulling the tumour forward during operation immediately relieved the distressed breathing. Following operation, breathing was normal. The pathologist reported colloid adenoma.

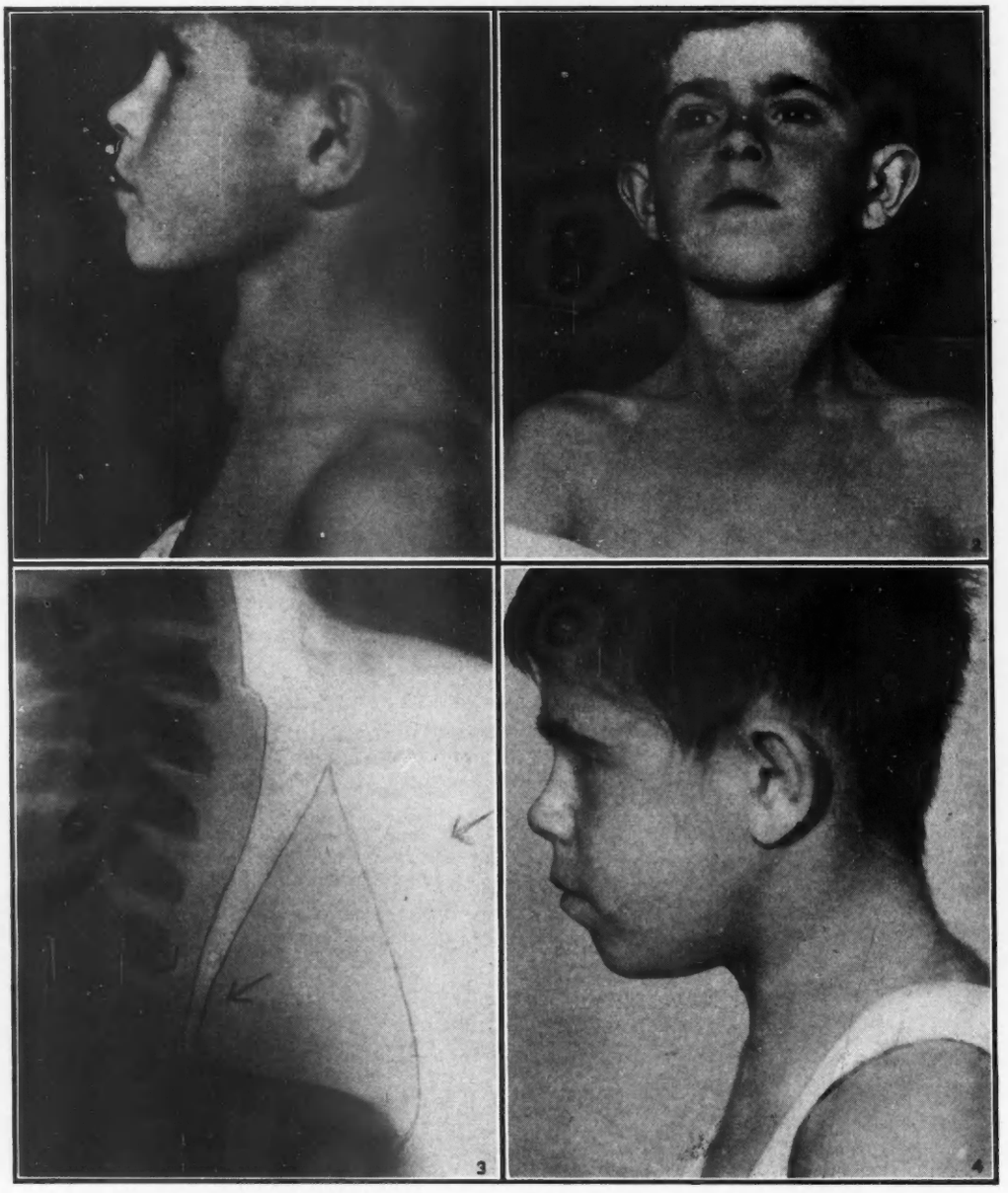

Fig. 1.—Obstructive colloid goitre midline in child. Case R. **Fig. 2.**—Note distortion of sternocleidomastoid. **Fig. 3.**—Note pinching off of trachea and pear-shaped adenoma in front. **Fig. 4.**—One year after operation.

One year later the child had gained two pounds. His principal states, "He seemed to have much more initiative and was more anxious to play with the other children". He could speak twelve words and his father thought his hearing was improved. His skin was drier. His sister thought he walked "stiffer" after the operation. This suggests myxœdema. Likely, the remainder of the gland was undeveloped. He receives now one-half grain of thyroid (Ayerst) a day.

The accompanying photographs show: (1) The thyroid enlargement. (2) The distortion of the sternocleidomastoid. (3) X-ray showing pinching of the trachea with pear-shaped adenoma. (4) Appearance of child's neck one year following operation.

Deaf mutism is occasionally accompanied by enlargement of the thyroid.

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A CASE OF COMPLETE HETEROTAXIS

BY B. H. LYONS

Birch Hills, Sask.

The accompanying x-ray illustrations were taken of an infant 6 weeks old. They are submitted as an instance of heterotaxis which may be added to the case reported by Rossien in this *Journal* (June, 1942).

The baby referred to was a male, and appeared to be normal at birth but his heart was not examined at the time. When seen six weeks later he showed signs of congenital heart disease —cyanosis and dyspnœa. The heart was found to be on the right side and was enlarged beyond the right nipple, the maximum impulse being at the xiphoid process. No murmurs were heard.

The child died soon afterwards and no autopsy was obtained. The x-ray pictures however clearly indicate the condition of complete heterotaxis.

Fig. 1

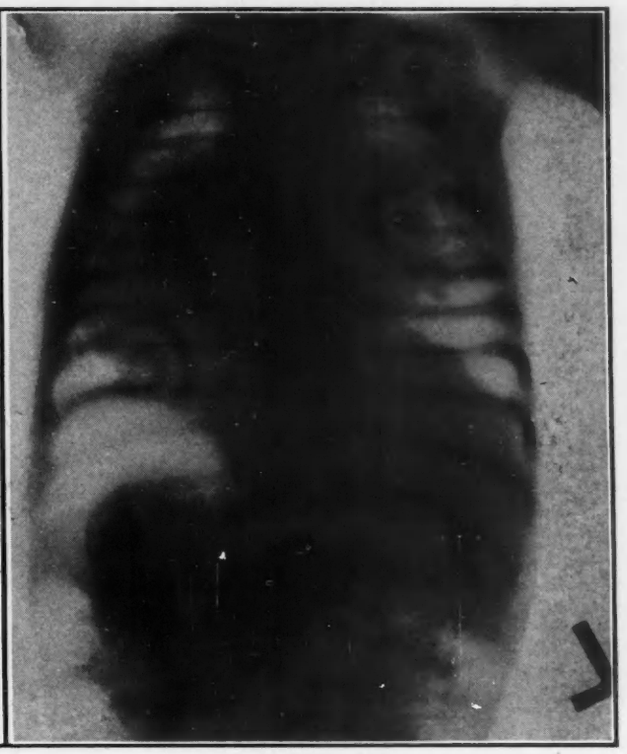

Fig. 2

Clinical and Laboratory Notes

SMALL BONE GRAFTS OF EXTREMITIES*

BY GORDON MURRAY, M.D., F.R.C.S.(Eng.) F.R.C.S.(C).

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Many fractures of the small bones of the extremities present a difficult problem in treatment. Quite commonly an ununited fracture of a phalanx or adjacent segment raises the question whether amputation might not be the best method of eliminating the disability and allowing an early return of function. There are some fractures in which this form of treatment unquestionably is suitable. There are many others, however, in which the function of the extremity as a whole is considerably impaired by such amputation. If a solid union of the fracture could be obtained, the prospects for almost a normal return of function are very good. The following is to report a series of cases in which the good return of function without mutilation more than justified the length of time required to obtain union in the fractures.

Naturally, the cases with infection and other important disabilities such as division of tendons and nerves, or impairment of blood supply would be better treated by amputation or probably, other methods. The cases in which this form of treatment is advocated are those, in which, if compound, the wounds have healed perfectly without remaining signs of infection or inflammation, the joints and tendons are intact, and

* From the Toronto General Hospital.

the nerve supply is normal. On all occasions the patients have been more than satisfied with the end-result which has restored useful function, and the patient's natural abhorrence for amputation has been averted.

Ununited fractures of the carpal scaphoid will be mentioned only in passing because the end-results of this operation will be reported elsewhere in the near future. This operation has been used so widely with excellent results that the end-results alone now commend the method to traumatic surgeons.

Fractures of the metacarpals:—The fractures to be dealt with by these methods are those in which there has been gross deformity, or lack of apposition resulting in non-union. Many of these are fractures through the neck or close to the head of the metacarpal, in which the distal fragment is depressed deeply into the palm or more rarely on to the dorsal aspect. This leaves a mass projecting into the palm which is so prominent that it receives excess pressure and for that reason it is quite sensitive. The knuckle has disappeared and the patient is greatly worried over the abnormal appearance of the hand. Quite frequently the proportionate length of the affected finger is so changed as to be disturbing to the patient. Whether the fracture has united in this position, or whether a non-union has resulted, the treatment advocated is the same. The fracture line should be reconstructed in the former or, if non-union has occurred, the fracture surfaces should be thoroughly cleared. Accurate reduction of the fracture is obtained. Appropriate bars of bone from the tibia are removed and shaped so that they can be driven into the proximal segment, and the distal fragment, after drilling a suitable hole at the right spot, is fitted over the distal three-eighths of an inch or thereabouts of the bone peg. Care is necessary in handling the fragments to avoid further fracture or breaking up of the cancellous bone of the

distal fragment. On no occasion has there been failure to accomplish a satisfactory reduction and fixation by this method. A similar technique has been applied quite satisfactorily to fractures of the metatarsals, which fractures usually occur also through the necks of these bones.

Fractures of the Phalanges:—In these bones also the fractures may be ununited or may be united with the fragments in malposition. Quite frequently the proximal fragment is flexed and the distal fragment extended at the fracture line, forming an angle which appears on the palmar surface as a prominence which may be quite sensitive because of its exposure to excess pressure. Frequently this may interfere mechanically with flexor tendons and this, together with the dorsal angulation, prevents closure of the digit during flexion. A lateral approach to the phalanx has given adequate exposure. If united, the fracture line is reformed, if ununited the fracture surfaces are cleared. A technique similar to that described for the metacarpal has been successful in maintaining a good reduction.

The proximal and middle phalanges are easier to handle than ununited or deformed fractures of the distal phalanx. In the latter the lateral approach is made, avoiding the finger nail or its matrix. The fragments here are too small and short to use intra-medullary pegs, as applied in the other sites. With chisels and other such instruments it is difficult to shape mortices in these fragments without breaking up the cancellous bone, of which they are composed. I have found, however, that by using a hand drill, multiple drill holes can be made in line in each fragment, from the exposed surface. It is an easy matter if the drill holes are well overlapped to break down the small amount of bone intervening between the holes to form a continuous mortice in each fragment. Naturally, this mortice must be placed so that the deformity at the fracture line will be overcome. A bar of bone removed from the tibia or elsewhere is shaped to fit this mortice and can easily be slipped into place in both fragments. On all occasions it has held the fracture satisfactorily, and if the graft is made to fit snugly no other form of internal fixation has been required.

Satisfactory union has occurred in all the fractures operated upon in this way. The deformity has been overcome and the patients are more than satisfied with the improved appearance. There has been no infection in any of the wounds. The functional results have been good in some and fair in others, but on all occasions none of the patients have suggested that they would prefer amputation.

While many surgeons have applied these principles, this report is presented as more evidence supporting conservative reconstructive surgery in fractures of this sort. There may be the objection that cortical bone of tibia has been used for the grafts, on the grounds that cancellous bone provides better osteogenesis. From my experience I prefer the tibial bone because it is stronger, is better to work with and provides more secure internal fixation, and the fact that all the fractures have united is evidence that while cancellous bone may provide more osteogenic tissue, this cortical bone provides adequate and probably excess osteogenesis.

Conclusions:—Ununited and malunited fractures of the small bones of the extremities under good conditions are better treated by conservative methods with open reduction and bone graft.

EFFECTS AND TREATMENT OF BLISTER GAS

The ever present threat of gas warfare makes it imperative that there should be repeated instruction in the methods of defence and treatment.

Manual No. 4* of the series of publications in the subject presents in great detail information required by First Aid and Rescue parties in dealing with gas poisoning. We select one item only for reproduction here, of blister gas and its treatment.

The illustration shows the effect of one drop of blister gas, half the size of a pinhead (about 1 mm.) applied to two different parts of the

arm (A and B). One drop (A) was removed a minute afterwards and anti-gas ointment rubbed in for half a minute. As may be seen the only visible effect is a slight erythema. In area B the drop was left untreated and the result was the large blister seen. This developed several hours later. It took about eight weeks to heal, and left a permanent scar.

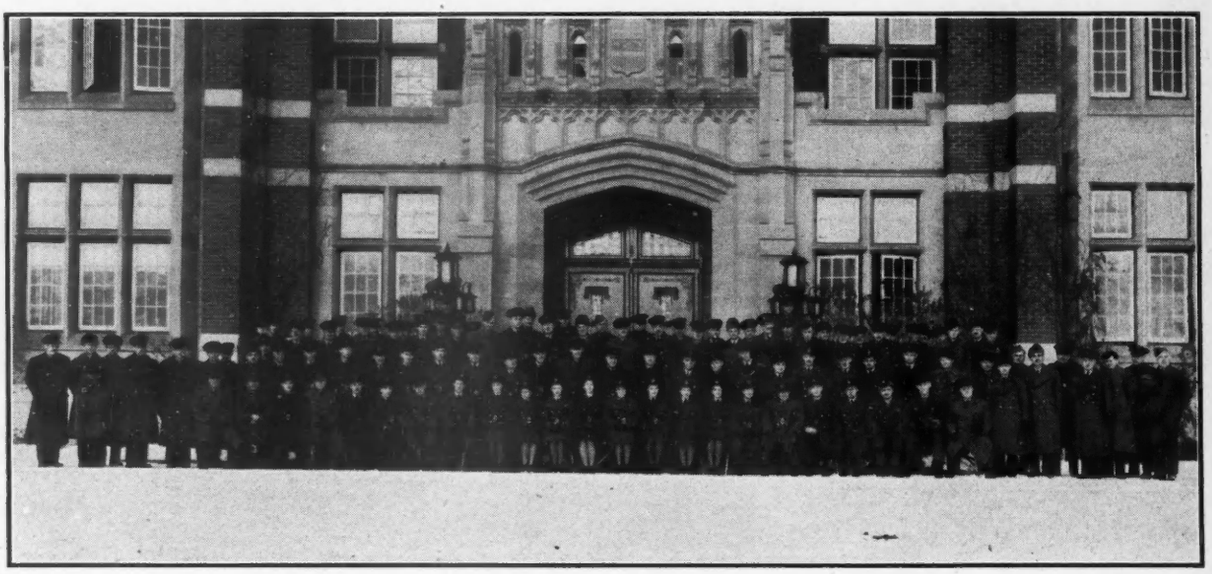
* Defence Against Gas. Manual No. 4, First Aid and Nursing for Gas Casualties. I. M. Rabinowitch. Published by authority of I. A. Mackenzie, Minister of Pensions and National Health, Ottawa, Canada, 1942.

R.C.A.F. Nutrition Conference

A two-day lecture course on nutrition was put on by the R.C.A.F. Medical Branch in various places across Canada during the month of December.

The tour began in Toronto on December 4th and 5th; moved to Winnipeg December 7th and 8th; to Calgary on December 10th and 11th; to Montreal on December 14th and 15th, and to Moncton on December 17th and 18th. Audiences consisted of the Senior Medical Officers at all R.C.A.F. and R.A.F. Stations, officers of the R.C.A.M.C., the R.C.D.C., and Medical Officers of the R.C.N., in addition to dietitians who have recently been enlisted as Messing Officers in the R.C.A.F. and hospital dietitians from the Army.

The course was organized by the School of Aviation Medicine—F./L. H. Dunham, Adjutant. The speakers were: Group Captain J. W. Tice, Deputy Director Medical Services, R.C.A.F.; Wing Commander F. F. Tisdall and Flight Lieutenant J. F. McCreary of the Medical Branch R.C.A.F.



R.C.A.F. NUTRITION CONFERENCE, CALGARY, DECEMBER 10, 1942.

The purpose of the tour was to acquaint Medical officers with the research program in nutrition being conducted in the R.C.A.F., with recent advances in nutrition, and with their responsibilities, shared with the Messing Officers, toward adequate nutrition of every man and woman under their care.

Blood donors who faint, particularly if the faint occurs after they have resumed work, have an adverse effect on the recruitment of men and women to this form of national service, and *The Lancet* has scrutinized the findings of various observers regarding collapse after blood-letting. Fainting is, of course, a natural response to the loss of blood, but this should not occur except under exceptional circumstances when amounts in excess of the customary donation are removed to cope with a sudden emergency. Collapse appears to be more common in the young, but it is disputed whether young women faint more readily than young men. Factors which do seem to contribute to fainting are fatigue and hunger: persons who hurry to their appointment are likely to faint, as are those who have not eaten for three hours or more. It is stated that the temperature and humidity of the donation room are unimportant, but it should be airy and light, with beds rather than couches, and no isolation of the donors by screens, as there is comfort in the knowledge that others are going through the same ordeal. Nervous donors need attention, and *The Lancet* suggests that the apprehensive subject who has volunteered for self-disciplinary or purely altruistic reasons or who has been pressed into service by an over-zealous propagandist should never be left unattended and mentally unoccupied. In general, donors should remain lying down for 15 minutes and after refreshment should sit in a chair for another quarter of an hour, leaving the hospital only after the lapse of 30 minutes since completion of the bleeding.—*J. Roy. Inst. Pub. Health & Hygiene*, 1942, **5**: 236.

Editorial

SOCIALIZATION, EDUCATION AND RESEARCH

SOCIALIZATION of medicine in Canada in the form of health insurance looms large on the political horizon. The need for such insurance must be as obvious to the medical profession as the fact that serious difficulties lie across the path of organization.

Also obvious, it would seem, is the fact that if the Government of Canada would enroll the members of the medical profession in a scheme of national health insurance, it must likewise take an active interest in medical education and research; for without the recent advances in the science of medicine, socialization would not now be worth the trouble. And, furthermore, the success of future federal schemes for the nation's health will depend upon the direct support of contemporary medical research.

In the past higher education on this continent has received important support from private endowment, although in Canada at least this has proved inadequate. Looking toward the future, it seems that income taxation may well dry up this source of assistance, so that, after the war, at the very time in world affairs when intellectual leadership might logically be expected to migrate westward, progress will be blocked unless some federal agency turns to the problem with clear vision.

Health insurance, so far as Great Britain was concerned, was inaugurated shortly before the outbreak of the war of 1914. After the war a University Grants Committee was created by the British Government. This Committee, being quite free from political and partizan influence, was instructed to investigate and stimulate higher education throughout the United Kingdom. It proceeded on the principle of contributing to those universities and university departments which showed promise of capacity for growth and development.

The excellent reports of the University Grants Committee[1] showed that in Great Britain there were fifty-nine institutions to be investigated, and of these sixteen universities and three university colleges were placed on the grants list. Annual aid was recommended of £2,250,000, which involved an increase of £270,000 over the previous years. That this constituted a comparatively large contribution is evident when it is realized that the total annual expenditure of British universities amounted only to £6,000,000, about half of which was taken up in salaries and in superannuation charges.

After making this recommendation the Grants Committee made the following important declaration, "We believe that the British universities may be trusted to make the best use of any new resources which may be made available." They added that, for the sake of independence, the main financial support should be from sources other than the State, for, to quote again: "Freedom is to a university the only atmosphere, the 'ampler ether', in which it can breathe and maintain its vitality." The Committee furthermore expressed the hope that their own activity would serve to stimulate private benefactions, a hope that received ample vindication in the lump-sum donations of such generous citizens as Lord Nuffield.

Our national government is better fitted to make a Dominion-wide impartial analysis of the universities than is any provincial or outside agency. The Government can hardly abolish by direct action what is imperfect, but it can contribute to what is excellent and full of promise.

The work of a University Grants Committee should not be confined to Medicine. It is also important to Canada that original work of the highest order should be carried out within her borders in other departments of the English and French-speaking universities. This applies equally to economics, philosophy, natural science, physics, chemistry, engineering, arts and music. The Government here might well stimulate higher education in two ways: by a series of selective grants through such a non-political com-

1. University Grants Committee, Reports 1929-30 to 1934-35, London, His Majesty's Stationery Office, 1936.

mittee, and by a system of university scholarships which is sadly lacking in Canada.

Much of the best scholar material is to be found in poor families. Unaided, young men and women miss the brilliant careers for which nature has endowed them. This is in contrast to Scotland, which, with her comparatively small population, is using university scholarships of very much greater value.

There is no longer any reason to perpetuate the pioneer tradition that leadership in the arts and sciences belongs in the old countries. Among Canadians the average brain contains as many convolutions, the racial inheritance is as sound, the will to work as great as in any other people. Opportunity to develop these talents would be greater if we chose to make it so.

In Canada it is not the function of the national government to control education. That is the very reason why the national government is better fitted to support, not primary and secondary education perhaps, but higher education and whatever leads to the flowering of the genius of the people of Canada in new and constructive work.

W. F. PENFIELD.

Editorial Comments

Acceleration of Wartime Medical Education

The necessity for producing trained medical men is so urgent that no one offers any opposition to the acceleration of medical courses, and it has met with no serious difficulties. It is a wartime measure and as such its undesirable aspects are accepted. If, however, any proposal should be made to apply the plan in principle to medical education in the future then it is time to examine it with a more critical eye than is now called for. This question is brought forward in a recent discussion on "The significance of War-time Acceleration in Medical Education" at the annual meeting of the National Board of Examiners, when the main speaker, Dr. V. Johnson, suggested that the acceleration plan might well carry over into the postwar period, because it represents attacks on problems in medical education of civilian as well as military importance. He felt, for example, that "the traditional organization of medical schools into departments of anatomy, physiology, biochemistry, etc. . . . is not maximally efficient educationally". To remedy this he would have the subject matter of the various departments presented in a well-integrated, conjoint course. That suggestion might be followed up.

Then Dr. Johnson dealt with the acceleration of medical teaching as being of possible advantage in itself. This opens up entirely different problems. The statement is made for instance, that "there is no necessary reason why 33 months of instruction given in three calendar years should be inferior to 33 months of instruction given in four calendar years. Exactly the same *quantity* of material can be presented and exactly the same number of hours devoted to each subject. Whether the *quality* of instruction will be reduced because of overwork by the faculty, or fatigue and impaired health of students, is a matter of opinion and should be a problem for study."

This is reducing the problem of medical education to simple terms indeed. After all, as it has been remarked, medical education is no different to education generally. If it is mere instruction only that is wanted, then the number of hours to be devoted to it might very well be simply increased, although such details as teachers, effect on health, supply of material, etc., could easily become insuperable difficulties. There is however an importance to be attached to time itself which cannot be overlooked. Maturity of judgment and of character, assimilation of ideas, development of method, all these demand something more than mere concentration of effort. Time may not produce maturity, but maturity must have time. In the discussion by Dr. Karsner a point was made also of the necessity for the teacher himself to be allowed time "for reflection, meditation, and formulation".

It cannot be said that the modern teaching of medicine needs no revision. It is probable that the present acceleration of training will bring out weak points in our methods, and show perhaps that there has been undue emphasis in certain respects, but when this tyranny of pressure shall be past we shall do well to remember the principles which should underlie all education.

Manual on Chemical Warfare

Attention is drawn to the announcement in our correspondence column by the Scientific Adviser on Chemical Warfare regarding the issuance of a Medical Manual on this subject. This manual is of great practical value, but it will not be possible to distribute copies wholesale. All medical men who take part in Air Raid Precaution work, however, will be supplied with it. The Department of this vital work will gladly welcome any doctors who can devote some time to it.

Medical Economics

Views on Health Insurance

For some time there have been indications at Ottawa that health insurance is receiving increased attention. Not only has the Federal Advisory Committee and its drafting nucleus been endeavouring to complete its task, but Parliamentary leaders on both sides of the House have shown augmented interest in the whole question of social security and of health insurance in particular. Although several developments of the past few months may have been stimulating factors, there is little doubt but that the widespread and favourable press comment on the "Beveridge Report" in Great Britain has given political leaders an indication of the trend of public thinking.

Whether or not the desire of the drafting committee to complete its assignment indicates any intention on the part of the Government to introduce a health insurance measure into the House this winter has not been known to the Committee of the Canadian Medical Association. Any Federal decision respecting the current session will probably have been announced before this issue reaches its readers. Lacking specific information, the Committee of Seven (actually now ten in number) has been proceeding on the safer assumption that such action would probably be taken.

In November, Dr. Harris McPhedran, Chairman of the Committee on Economics, sent a list of questions to each Divisional Committee on Economics. These dealt with specific points respecting which the Committee of Seven and the Federal Committee were concerned. On December 9th and 10th the Committee of Seven met in Ottawa to review the questionnaire replies and to draft further recommendations to the Federal Advisory Committee. On December 11th and 12th, the Committee of Seven, of which Dr. T. H. Leggett is Chairman, met the drafting nucleus of the Federal Committee: Dr. J. J. Heagerty, Chairman; Mr. A. D. Watson, actuary; and Mr. A. G. Gunn, legal adviser.

SUMMARY OF REPLIES

1. It would seem generally satisfactory to have the Federal administration under the Minister of Health, with an Advisory Dominion Council on Health Insurance, and to have the Provincial administration under a Commission.

2. As opinions varied respecting the desirable size of the Commission, it was recommended that the detail of size be left for decision in the individual provinces. The importance of a Medical Services Committee (Principle No. 3) was stressed.

3. The family physician should become an integral part of the Public Health program. This service should be under the general guidance of the proper health official and be adequately paid for.

(On December 7th in Toronto, and on the 17th in Winnipeg, members of this Committee met Public Health representatives to study the possible scope of this activity.)

4. It was generally agreed that it should be left to the individual province to determine: (*a*) the income level for compulsory inclusion; (*b*) the method and rate of payment for service; (*c*) the method and rate of contribution.

5. As only a few provincial committees submitted estimates and analyses of costs, the Committee of Seven did not feel justified in making definite recommendations.

6. Certification of Specialists. The President of the Royal College of Physicians and Surgeons of Canada, Dr. A. T. Mathers, explained at a conference on December 10th that this body had been working on certification since 1937 at the request of the Canadian Medical Association. Up to the present a limited number of specialties (anæsthesia, dermatology and syphilology, otolaryngology, pædiatrics, radiology and urology) had been approved for certification. Certification is quite apart from Fellowship or Membership. In certifying specialists for health insurance purposes consideration would be given to years of experience as well as to special training, and to the exigencies of local situations, particularly in less populated areas. University certificates for special training would be recognized.

While this would appear to be a matter for the Regulations rather than for the Draft Act, it was recommended that lists of specialists as prepared by the Royal College of Physicians and Surgeons of Canada, be recognized, subject to the approval of the organized profession in the province concerned.

7. The insured person should have the right to select (*a*) his personal or family doctor and (*b*) his specialist.

Opinion has varied as to the extent to which the insured person should be able to consult a specialist directly. After considering various viewpoints the Committee recommended that the clause giving the insured person the right to select a specialist or consultant should stipulate that such be "*ordinarily* after consultation with and on the recommendation of the medical adviser". This would permit considerable leeway.

8. (*a*) Each insured person should be required to name his medical adviser. (*b*) It should be left to the individual province to indicate the length of time for which the insured person would be required to name his medical adviser; and the length of time before notice of change to another medical adviser would become effective.

9. Accessory services, such as ambulance provision and appliances, should be supplied, but only on the request of the medical adviser and on the authorization of the Regional Medical Officer.

10. Opinion varied as to whether remuneration should be on a fee for service basis, or on a basis of capitation for general practitioners with fee for specialists, or one of the above with salary in certain districts. It was decided to leave this to the individual province [see Ans. 4 (*b*)], but it was recommended that the section in question indicate that this "be determined after consultation between the representatives of the profession and the Commission".

11. The suggested re-wording of some of the clauses relating to hospitalization was approved.

12. Opportunities for clinical observation in teaching hospitals must be maintained. This was agreed to by the Divisional Committees and was emphasized by the Committee of Seven. On December 10th a conference was held with representatives of the medical schools at which time a joint resolution was passed:

> "Moved that we recommend that in the Provincial Draft a satisfactory clause, or clauses, be inserted making it mandatory for the Commission to make whatever arrangements are necessary to ensure adequate opportunities for clinical teaching as may be determined from time to time by the teaching authorities and the medical licensing body of the Province."

It was agreed that the general wards in teaching hospitals would need to be under the control of the teaching staff and that patients in such wards be available for teaching.

13. (*a*) Transients from without the province should be covered by reciprocal arrangements with other provinces having a health insurance measure, or by other arrangements.

(*b*) and (*c*) Insured employees leaving the province for, say, a branch in another province without health insurance, should be retained for a reasonable period in the home province plan, but should not be retained indefinitely.

(*d*) The suggestion of having a small head tax to provide coverage for tourists from the United States and elsewhere was not approved.

14. It was agreed that there should be no exclusions from the operation of the Act. On this point the Divisional reports were unanimous.

15. There is no objection to the recognition of clinics under the measure. This does not mean the recognition of plans sponsored by a clinic group.

16. Cash benefits should not be recognized as part of the benefit plan. Realizing that there will be strong pressure for the inclusion of such, it was recommended that, if such be deemed necessary, it be from a special fund apart from the regular Health Insurance Fund.

17. If there be an income ceiling for compulsory coverage, voluntary coverage above that level should not be permitted.

18. (*a*) It has been proposed that it be required that repeat prescriptions be re-written. The explanation given was that prescriptions would possibly be unavailable for several weeks when being checked centrally for payment to the druggist and, if the druggist be required to copy all prescriptions before sending them away to the insurance offices, extra expense would be involved. However the majority of Divisions and the Committee did not agree with this suggestion.

(*b*) The encouragement or discouragement of dispensing by doctors was left for consideration in the individual provinces.

(*c*) Doctors should be paid extra for any drugs dispensed.

(*d*) The preparation and adoption of an official formulary was approved.

19. *Nursing.* In the homes, the services of visiting nurses only should be provided. In exceptional cases, full-time nursing might be provided if requested by the doctor and if approved by the Regional Medical Officer.

20. The plan of assessing non-employee contributors on the basis of their ability to pay was approved.

On December 11 and 12 the Committee conferred with Dr. Heagerty and his associates. This was a very valuable conference, permitting as it did the submission of the above points and a full discussion of many others raised by various members of either group. There was free discussion of the nature of the Federal control, the possible composition of Provincial Commissions, measures for meeting unusual demands resulting from epidemics, etc., and the likely duties of the Regional Medical Officers. In discussing costs, it was pointed out by our Committee that costs will probably rise appreciably and that this should be considered in evaluating existing costs of services.

SPECIAL MEETING OF COUNCIL

In view of the rapid developments taking place, the Executive Committee, on the recommendation of the Committee of Seven, called a meeting of General Council for January 18 and 19 of this year in Ottawa. This was preceded by a two-day meeting of the Executive Committee. On the assumption that some legislative action might take place this winter, it was considered vital that the medical profession be in a position to state definitely, for instance, whether or not it favours the principle of health insurance. This basic point has not at the time of writing been decided by General Council. This meeting enabled the representatives of the various Divisions to obtain a clearer knowledge of Federal proposals and permitted full debate of various points concerning which a high degree of unanimity of opinion is desirable.

Men and Books

BARON LARREY—SURGEON GENERAL TO NAPOLEON'S ARMY

BY A. R. MUNROE, M.D.

Edmonton

Jean Dominique Larrey, who was created a Baron by Napoleon, was born at Bandeau, a village near the Pyrenees in July, 1766. As Larrey and his brother were brought up by an uncle it is presumed by historians that he was left an orphan at an early age. The uncle, Alexis Larrey, who was the chief physician and surgeon to the Hospital la Grove in Toulon, was a corresponding associate of the Royal Academy of Surgery in Paris. He saw that both his nephews were properly educated, and both studied medicine.

The subject of this paper received his medical education at Toulouse and Paris, graduating when he was twenty-one. He spent a short time in the naval medical service before he was assigned to the army and it was his career as an army surgeon that led him to fame. He very early showed evidence of exceptional ability and leadership. While in the navy, waiting for something to happen, he organized the junior surgeons of the fleet at Brest into a study group and gave them lectures in anatomy. This urge to teach is found throughout his life and whatever country the French army invaded Larrey could be found on good terms with the members of the medical profession there. In Italy he visited the principal medical schools and contacted the professors of anatomy and surgery and made staunch friends of them. In the campaign against Prussia in 1812 he established his hospital headquarters in Berlin. Here he gave lectures and instruction to the surgeons of the army, having them perform operations in his presence. The junior surgeons of the Berlin Academy also attended these lectures and they were encouraged to do so by M. Chevalier Goercke, the surgeon-general to the Prussian Army. In fact, Goercke put the Berlin Anatomical Museum at Larrey's disposal, and a lasting friendship was formed with General Goercke and men under him such as Hufeland, Graefe, and Rudolphi. Even in the retreat from Moscow after the evacuation of Königsberg Larrey passed through Leipzig in order that he might visit the anatomical museum and view the anatomical specimens of nerve dissections prepared by the great Halle. Here he met the son of Meckel, already an accomplished professor, who showed him the splendid collection made by his father.

Such was the character of the man who became the leading French surgeon of his day. His ability to make friends everywhere served him in good stead when taken prisoner at Waterloo. He was about to be shot when he was recognized by one of the Prussian doctors who had listened to his lectures in Berlin. This was the closest call Larrey ever had. He had been placed against the wall and the trigger was about to be pulled when a Prussian regimental officer interfered. He had Larrey taken to Marshal Blucher, who invited him to breakfast, supplied him with a sum of money, and provided an escort to see him safely to Louvain. Larrey had saved the life of Blucher's son in the Austrian campaign.

Larrey was the first military surgeon to be mentioned officially in military dispatches. The dispatch read, "Among those who brilliantly served the Republic on this day were the surgeons, Major Larrey with his companions of the flying ambulances whose indefatigable attention to the wounded contributed essentially to the cause of humanity and their country". The dispatch was in July, 1793, and the incident was the battle for the raising of the siege of Metz. He was given the Legion of Honour in 1804 and later made a Baron, and when Napoleon died in 1821 he left Larrey 100,000 francs.

Larrey's life was a very busy one, but he found time to write a good deal. His first published article was entitled "Surgical Account of the Army of the East", which he dedicated to Napoleon Bonaparte; it was published in 1802. In it he described his medical experiences in the taking of Malta, Alexandria, Egypt, the Suez Canal, and Syria. After the Austrian campaign he used his leisure to write three volumes of his Surgical Memoirs. The fourth was written after the Russian campaign. His Memoirs constitute the history of his life and in them are minutely and instructively described the countries and cities through which he passed, the people with whom he associated, the wounds examined, the operations performed, and the battles in which he was engaged.

To him the world owes the introduction of the field ambulance. Until his day army hospitals were situated at least three miles behind the lines and the wounded were not collected until after the battle was over. Often the wounded were abandoned, especially if the army was in retreat. In the first campaign against Prussia often twenty-four to thirty-six hours elapsed before wounded men received any medical aid at all. These circumstances stirred Larrey into creative action and he organized what he termed flying ambulances. Each ambulance had a personnel of three hundred and forty, officers, sub-officers and men. Each

*Presented before the Section of Historical Medicine, 73rd Annual Meeting of Canadian Medical Association, Jasper Park, June 19, 1942.

division has twelve light carriages and four heavy ones. There were both two-wheelers and four-wheelers equipped with easy springs and furnished with mattresses. Wounded men were transferred at once from the battlefields to first line hospitals. They collected the dead as well as the wounded so that no one should be neglected. Field ambulances have remained a basic division of all army medical services from that day to this. It was the organization of the field ambulances which brought Larrey to the attention of Napoleon in the Italian campaign. Recognizing their importance to military operations and the genius of the man who introduced it Napoleon appointed Larrey to the post of Surgeon-General. Armies in those days were not so large as they are today, and Larrey always remained an operating surgeon. During the advance on Moscow, one of the bloodiest battles of the war took place in the Mosiack hills where over 600,000 men were engaged in battle from 6 a.m. to 9 p.m. Forty generals and 13,000 men were either killed or wounded. Two-thirds of these had to be admitted to hospital and it is said that Larrey himself performed 200 operations.

By the time of the Russian campaign Larrey's experiences in the care of the wounded were very extensive and his opinions crystallized. Many of his observations will not be challenged even today. He had now become fully convinced of the value of primary amputations when amputation was indicated. His ability to select cases where amputation was not indicated saved many lives and his ability to select cases for primary amputation saved much suffering. His ability to tell when the knee joint was involved or not involved enabled him to introduce an amputation below the knee joint at about the level of the tuberosity of the tibia. Before this, shattered fractures of the tibia were amputated through the mid thigh. Larrey's method enabled the knee to be saved and many soldiers were able to make wooden pegs for themselves.

It is not surprising that Larrey should have had wide experience in treating frozen limbs. He early saw the futility of early amputation and advised that the frozen limbs be allowed to inflame and suppurate. He used dressing of dry powder and lint, and when the slough detached he treated it as a simple ulcer. "The surgeon should not look for a speedy union but should be content with approximation by pieces of linen". When the limit of mortification was at a joint he advised simple disarticulation and then closing over the articulation.

In gunshot wounds of the chest he advocated the removal of the foreign body. For, said Larrey,

> "The presence of the foreign body keeps up an inexhaustible supply of purulent matter with empyæma or collection of this fluid. In all cases nature labours for the expulsion of the foreign body and endeavours to prevent its impeding the function of the parts with which it is in contact. The foreign body is detached by the suppuration occurring at the point where it is first arrested and then the weight of the foreign body carries it to the most dependent situation. A new seat of purulent secretion is established and keeps up a continuous empyæma with fistula. On the contrary when the ball becomes fixed in the substance of the parietes, gets into the intercostal space, and is made stationary in this position, it may remain a long period without giving rise to remarkable symptoms. It rarely makes its way externally."

Larrey advocated the removal of these foreign bodies and claimed to be the first to make this claim. To remove them he states a section of rib must be removed, and for this operation he employed a lenticular knife.

Larrey was always a careful observer of his cases and recorded in great detail cases of unusual interest. The following is an example: A Polish officer was wounded twenty-four hours previously. His body was inflated to an extreme degree by a general emphysema and the skin so distended as to render the limbs stiff and inflexible. The folds surrounding the joints were effaced and the eyes closed by the turgescency of the lids. The lips acquired a prodigious thickness and impeded the passage of liquids into the mouth. The pulse and respiration had nearly ceased and the voice was feeble and interrupted. This officer had had his lung pierced by a spear which penetrated under the scapula. The air continually escaping from the lung spread into the cellular tissue whence it expanded through the body, giving rise to this enormous emphysema.

His treatment (which by the way saved the patient) consisted in removing the adhesive strapping from the wound and laying it wide open so that the perforation in the thorax was in line with the wound in the lung. Dry cups were applied to the wound and were speedily filled with gas and blood. Cups with scarification were applied over the whole surface of the body but chiefly to the thorax and extremities. Those parts to which cups could not be applied were simply pricked. The patient was much relieved by the treatment and on the return from Moscow Larrey had an opportunity of seeing this officer who had entirely recovered normal health.

Larrey was the first surgeon to incise the pericardium. The following is the unabridged description of his operation.

> "An oblique incision is made from over the edge of the ensiform cartilage to the united extremities of the cartilages of the seventh and eighth ribs. The cellular tissue being divided with some fibres of the rectus and external oblique muscles. There remains only a portion of the peritoneum, called its false layer, above the pericardium which can be seen after the division of all the intervening cellular tissue projecting between the first and second digitations of the diaphragm. Into this the bistoury is entered with the precautions of doing it with the edge turned upward and directed a little to the left to avoid the peritoneum. The smallest portion possible of the anterior border of the diaphragm is next divided where it is attached to the inner part of the cartilage of the seventh rib. The internal mammary artery is to the

outside. The patient should be placed perpendicularly and supported on his bed which inclines the anterior part and base of the pericardium to the fore part of the chest."

I am not familiar with figures that would give us an idea as to what percentage of wounds were chest wounds, what percentage were head wounds or abdominal wounds, but Larrey seemed to give a good deal of space to his observations on head injuries and he must have been deeply interested in them. These were the days of the musket ball and hand to hand fighting, and head injuries may have been proportionately great.

He divided head injuries sharply into two classes, those in which the trephine is indicated and those in which it is not used. That his mind was fully made up on this question can be gauged by the following paragraph.

"The trephine should not be used in wounds of the head accompanied by fracture of the cranium whatsoever may be the extent of the fracture and number of its radii, if the fragments of bone be not driven inward, no foreign body present, or symptoms of compression not evident. The brain suffers less from concussion in those instances of extensive wounds with loss of substance in the soft parts and fracture of the bones of the cranium, since the effects of shock caused by the wounding instrument are expended on the external injured parts, particularly when it acts on the diagonal direction of the vault of the cranium. In consequence of the internal parts escaping lesion the absorption of effused fluid is effected more speedily. The fragments of bone gradually approximate and the disease may be cured by the effects of nature. The trephine, without being beneficial in such cases, cannot but retard the cure of the patient."

He wrote extensively on Hernia of the Brain and his observations might easily have been written by one of the surgeons of the last war.

In the treatment of gunshot wound of the abdomen he also advocated the wound being laid wide open, the foreign body removed and dry cups applied over the wound, giving the patient anti-spasmodic anodynes. When the omentum protruded from the abdominal wound Larrey insisted on its being left until the portion outside the abdomen separated by slough unless it could be reduced at the time of injury and before the swelling had supervened in the protruding part. He protected the omentum from the air and prevented it from adhering to the edge of the wound by using a dry dusting powder. When the slough separated the stump retracted within the abdomen and the wound gradually healed. Up until this time he records that it was the usual practice to tie off the omentum and cut away the protruding portion, with resulting secondary hæmorrhage followed by violent inflammation and gangrene or death.

Up until this period gunshot wounds and other battle injuries to the bladder were considered fatal. Hippocrates stated it to be so and no one believed otherwise until Larrey wrote concerning wounds of the bladder.

"The bladder is rarely injured when empty. The ardour of the soldier in battle and the continuance of the fight diverts the soldier from emptying it of its contents and the fluid accumulating in its cavity offers a large surface in the pelvis and the wounding instruments cannot enter the bony case without touching or cutting this viscus. Wounds inflicted by the sword or bayonet or spear may pierce the bladder in one of the points of its circumference or may pass through both of its parietes from side to side. These wounds are usually fatal, as the urine escapes through the wound and is effused into the cavity of the abdomen. These die inside of twenty-four hours in consequence of inflammation and gangrene. But if the wound penetrates the bladder towards its upper part at the point where the bladder is not covered by peritoneum the patient may recover unless it be accompanied by copious internal hæmorrhage. Treatment should include the tying in of a gum catheter to keep the bladder empty and the immediate opening of any abscess that forms in the region of the bladder as a result of extravasation of urine. In gunshot wounds of the bladder the ball may pass through both its walls or may be arrested in its cavity. When the ball shall have traversed the bladder from side to side and effected its exit the urine will immediately escape, together with blood, through one of the wounds, or both at the same time according to their situation."

Larrey's description of the burning of Moscow is a little different from what we generally read. He states that on September 14 when they reached the outskirts of the city the houses all appeared to have been abandoned and they noticed several fires burning. All these were extinguished and the French army was preparing to settle down for a comfortable winter, but when the Russian army retired it unlocked the prison doors so as to allow the prisoners to shift for themselves and the prisoners went about setting fire to the city and no matter what steps the French soldiers took to stop them they failed. If they shot some, others went on with complete disregard for what might happen to them. The flames were fanned by the equinoctial winds which blow in Moscow at this period and the city was soon consumed in flames, all but the Kremlin, the palaces and some large houses and churches which were built of stone.

The hospitals of Moscow impressed Larrey very much. The Hospital of the Foundlings he describes as the most extensive and most beautiful in Europe. It was situated on the edge of Moscow and was protected by the cannon of the Kremlin. It consisted of two buildings. The first, in which was the door of entrance, was designed for the residence of the governor, and for the government officers, the surgeons, and all the individuals connected with the duties of the hospital. The second building was a perfect square. In the middle of the court there was a fountain and a reservoir distributing the water of the river throughout the hospital. It consisted on all sides of four lofty stories around which ran a corridor of little width but sufficiently spacious for the free circulation of air and passage of persons through it. The rooms occupied the remaining breadth and entire length of the wings of the building. In each compartment there were two

rows of beds, provided with curtains, their size being proportional to that of the children. Boys and girls were in separate quarters. The greatest order and neatness reigned thoughout this establishment. The greater part of the rooms in both buildings were arched and proof against fire. The manufactories and all the accessories of this institution were in the highest state of improvement. The Russians in their retreat took the children over seven with them and there remained in the hospital only a small number of the younger class. This hospital was taken over by Larrey and made into a military hospital for the treatment of both French and Russian wounded, and when the retreat was ordered, Larrey left the surgeons of three divisions in charge of this hospital in order to leave the patients with the necessary attendance.

After the city was burned plenty of provisions were available to have fed the French army all winter but the temptation for loot and securing a free supply of wine from the cellars of the burned houses resulted in a complete demoralization of the discipline of Napoleon's army, and it was for this reason that the retreat was ordered. Napoleon's generals advised a return through the Ukraine but they were over-ruled by him, who ordered the return by the same route as they had come: *viz.*, by way of Königsberg, Vilna and Kowna. The retreat started on October 19, and was most disastrous. The French army was no sooner on the march than the Cossack bands began to harass them from everywhere. They came out of fog, out of the night, out of the forest just passed, and gave the French army no opportunity to rest. Food became scarce, frozen limbs were numerous, and often the soldiers only had soup made from the flesh of the horses that died of exhaustion for food. At the end of the march only 3,000 remained out of an army of 400,000. Many divisions reached France with as few as 350 men.

At the end of this campaign Larrey wrote the fourth volume of his surgical Memoirs. He remained in the service of the Emperor until the abdication. After Waterloo, Napoleon now in eclipse, the French nation stripped Larrey of all his honours and for a time he was poor, but never so poor that he would accept service in a foreign country. Although reduced to straitened circumstances he refused an offer to go to Brazil as Surgeon-General to Dom Pedro. He refused a similar office from the Czar of Russia. He remained loyal to France in spite of his penury. In 1826 he toured the British Isles accompanied by his son, also a doctor, and was everywhere received with the marks of distinction and honour becoming to him. On his return to Paris after this trip he was given back his post of Medical Inspector-General which he held until his death in 1842.

CATECHISM IN MEDICAL HISTORY

BY HEBER C. JAMIESON

Edmonton

QUESTIONS

1. For what would you use a pedometer?
2. Who first taught the value of auscultation?
3. Name four country physicians who turned their handicaps into advantages and climbed to greatness?
4. What well-known English physician of the seventeenth century once sent a patient several hundred miles to consult a non-existent consultant?

ANSWERS

1. To measure infants.

   [It is a matter of spelling. A "pedometer" is an instrument for recording distances travelled on foot. A "pædometer" takes measurements of children.—ED.]

2. Hippocrates (460-377 B.C.) placed the ear on the chest and listened to the sounds produced. When there was fluid and air he noted a splashing sound (Hippocratic succussion). He also called attention to a sound as of the rubbing of soft leather (the pleural rub).

3. (*a*) Edward Jenner who discovered the value of vaccination.

   (*b*) William Beaumont (1785 to 1853). Was the first to study digestion and the movements of the stomach *in situ*.

   (*c*) Robert Koch (1843 to 1910). Originator of modern bacteriology by plate cultures. Discovered the tubercle bacillus in 1882 and the vibrio of cholera in 1883.

   (*d*) James MacKenzie. A pioneer in the graphic study of the heart.

4. Thomas Sydenham sent a victim of hypochondria to Scotland telling him to consult a certain doctor of great skill. The patient made the arduous journey by stagecoach to find no such doctor existed. He returned to London full of rage, but cured of his complaint.

Medical War Relief Fund

We have received the following from the Treasurer of the Medical War Relief Fund.

Dr. Frank S. Patch,
Honorary Treasurer,
Canadian Medical Association.

Dear Dr. Patch,

Very many thanks for your letter of October 22nd enclosing a draft for $195.00 (£43. 12. 6) being contributions from the British Columbia and Saskatchewan Divisions towards the Medical War Relief Fund. We are very grateful for all the help we are receiving from Canada. I enclose an official receipt herewith.

Yours sincerely,
G. C. ANDERSON

December 10, 1942.

Dr. Frank S. Patch,
Honorary Treasurer,
Canadian Medical Association.

Dear Dr. Patch,

Once more I have to thank you for a further contribution to the Medical War Relief Fund from the Canadian Medical Association. I enclose an official receipt for £27. 14. 9 the amount of the donation from the Saskatchewan Division.

Yours sincerely,
G. C. ANDERSON

December 19, 1942.

The following additional subscriptions have been received:

Saskatchewan Division	$223.00
Victoria County Medical Society	50.00
Huron County Medical Association	80.00
Kent County Medical Society	35.00

A subscription of £18. 8. 6 has been sent directly to London by a doctor from British Columbia.

Medical Societies

Gaspé United Services Medical Association

The first meeting of the Gaspé United Services Medical Association, was held on December 7, 1942, in the military wing of the Gaspé Military Hospital.

Major B. Hebert was elected Honorary President, Capt. Berbrayer, President, and F./L. MacIntosh, Secretary.

Major B. Hebert presented a paper on "Œsophageal spasm".

The newly formed association is made up of army, navy, air force, and civilian doctors.

O. C. MACINTOSH

The Montreal Physiological Society

The November meeting of the Montreal Physiological Society was held in Lecture Room B of the Medical Building, McGill University, on Monday, November 16, 1942, at 8.30 p.m.

The Scientific Program consisted of the following papers.

1. The effect of calcium precipitating agents on the rapidity of wound healing.—Louis-Paul Dugal and Henri Laugier, University of Montreal, Montreal.

2. The metabolism of desoxycorticosterone.—M. M. Hoffmann, V. E. Kazmin and J. S. L. Browne, University Clinic, Royal Victoria Hospital.

3. Morphological changes in the cardiovascular system and the kidney following treatment with desoxycorticosterone acetate.—Hans Selye, Department of Histology, McGill University.

Clinical Conference held at No. 1 Canadian General Hospital on October 29, 1942

SURGICAL DIVISION

Major C. M. Spooner presented the first paper on "Hydronephrosis". He reviewed the interesting features of 8 cases, the main object being to show how they should be dealt with in the Canadian Army Overseas. In non-infected cases he discouraged plastic procedures as they were time-consuming and results were uncertain. Several cases illustrated this point. Interesting x-ray photographs and drawings were included in this presentation.

Captain W. S. Keith presented a patient who had sustained serious bilateral fractures of the maxilla complicated by meningitis. The organism, a pneumococcus, was isolated by cisternal puncture. The prompt use of sulfonamides (soludagenan and sulfapyridine) resulted in recovery. He stressed the early diagnosis and early use of sulfonamide therapy if a cure was to be obtained and complications were to be prevented.

Two patients, Dieppe casualties who had sustained gun shot wounds of skull and brain with retained fragments, were presented. The wounds were situated in the low temporal and low occipital regions. These cases prove the ineffectiveness of the steel helmet for these areas. Operation had been performed more than 30 hours after wounding and primary healing was obtained.

Major C. McG. Gardner's presentation was a series of cases which presented a variety of interesting clinical conditions.

1. Staphylococcus bacteriæmia successfully treated by use of sulfathiazole and neoarsphenamine. The local lesion was osteomyelitis of the femoral shaft. Discussion favoured continuance of conservative treatment. For contrast, another patient was shown in whom in all signs of acute osteomyelitis were present and

which proved to be an infected hæmatoma in the quadriceps muscle.

2. Acute abdominal conditions:—(*a*) Rupture of spleen from a trivial injury with delayed hæmorrhage, treated by splenectomy. (*b*) Massive intra-abdominal hæmorrhage from ruptured right kidney, successfully treated by abdominal nephrectomy. (*c*) Perforation of small intestine by swallowed splinter of wood. (*d*) Crush injury of abdomen with perforation of distended loop of jejunum. (*e*) The use of the free omental graft in a case of chronic perforated duodenal ulcer adherent to liver and gall bladder.

3. Fracture of the carpal scaphoid with displacement. An indication for excision.

4. The use of the palmaris longus graft for severed flexor tendons of the fingers.

5. Two cases of rectal carcinoma treated by St. Mark's Hospital "two teams' technique", where either the perineal-abdominal or abdomino-perineal operation could be performed. A demonstration of the special stirrups and points in technique was given.

The afternoon session was confined to the presentation of fractures of the lower limb, namely shaft fractures of femur and tibia and fibula. Lieut.-Col. S. J. Martin opened the presentation by stating that this series of 92 shaft fractures of the tibia and fibula and 38 fractures of the femur, are those treated since taking over this hospital approximately 10 months ago. He reviewed the main features of the treatment policy presented at a previous meeting, namely, closed method, traction, the open wound method, use of sulfonamides, early weight-bearing, physiotherapy, etc. Impressions gained from this series were briefly discussed, particularly, the justification of the open wound method in war surgery, internal fixation in selected cases, physiotherapy and rehabilitation, etc., etc.

Captain H. R. Robertson reviewed the 92 cases of lower leg fractures, with particular emphasis on the method of treatment complications, union and results to date and disposal. There were no cases of non-union. Fat embolism and vasospasm were the two complications discussed in detail.

Major J. G. Shannon reviewed the series of 38 fractures of the femur in much the same manner. From this series he was able to show that this fracture was a serious problem in the Army. Knee-joint complications and rehabilitation were discussed in detail.

Captain J. C. Dickison dealt with the subject of bone-plating in late and infected compound fracture where repeated attempts at reduction had failed. Five cases were reviewed in detail and end results shown.

S. J. Martin
Lieut.-Col. R.C.A.M.C.
O. i/c Surgical Division.

Clinical Meeting at No. 15 Canadian General Hospital, Canadian Army Overseas

The monthly meeting of Canadian Hospitals in England was held at No. 15 Canadian General Hospital on September 24, 1942. In addition to representatives from the medical and surgical divisions of all Canadian Military Hospitals and Casualty Clearing Stations there were present:

Brigadier R. M. Luton, M.G., D.M.S., C.M.H.Q.; Col. C. A. Rae, E.D., D.D.M.S., C.M.H.Q.; Col. L. C. Montgomery, M.C., V.D., Consultant Physician; Col. J. A. MacFarlane, Consultant Surgeon; Col. F. A. van Nostrand, Consultant Neuropsychiatrist; Lt. Col. M. H. Brown, A.M.D. 5., C.M.H.Q.; Col. Chas. P. Fenwick, M.C., A.D.M.S. 2nd Canadian Division; Col. W. A. Jones, A.D.M.S. 4th Canadian Division; Col. G. A. Sinclair, A.D.M.S. 1st Canadian Army Troops; Surgeon Rear Admiral Gordon Gordon-Taylor, Consultant Surgeon, Royal Navy; Col. H. H. Blake, R.A.M.C., A.D.M.S. Aldershot District; Col. W. H. O'Riordon, M.C., R.A.M.C., O.C. Cambridge Military Hospital; Lt. Col. d'Abreu, R.A.M.C. Officer i/c Surgical Division Cambridge Military Hospital; Lt. Col. N. T. Whitehead, R.A.M.C., Asst. Director, Pathology, South Eastern Command; Lt. Col. W. S. Middleton, Consultant Physician U.S. Army in England; Major Davis, Asst. Consultant Surgeon U.S. Army in England; Dr. K. B. Turner, O.S.R.D., (U.S.A.); Dr. Green, Medical Research Council.

Medical Officers from Field Ambulances and other units stationed nearby brought the total attendance to approximately one hundred.

Following coffee provided by Principal Matron M. R. Shaffner and Nursing Sisters, the meeting began at 1030 hours, with Col. R. M. Harvie, E.D., O.C. No. 15 Canadian General Hospital in the chair. Papers were presented based on the experiences gained in handling casualties from the Dieppe Raid. The morning program was as follows:

1. Scheme for handling a large number of casualties in a short period of time in use at this hospital.

(*a*) Admitting, Triage, General Organization. Lieut. Col. R. C. Dickson. (*b*) Resuscitation Ward, Major N. B. McGillivray. (*c*) Department of Radiology, Major A. C. Singleton. (*d*) Operating Theatre, Lieut. Col. A. W. M. White.

2. Compound Fractures, Major T. R. Sargeant.

Luncheon was served to 90 Officers in the Officers' Mess.

The afternoon session began at 1400 hours, and consisted of four papers as follows:

1. Wounds of Chest. Major W. A. Oille.

2. Wounds of Abdomen. Major F. G. Kergin.

3. Wounds of Joints. Major A. G. Shaw.
4. Gas Gangrene. Capt. R. R. Mutrie.

All papers were well received and provoked valuable discussion.

The meeting concluded with tea served in the Officers' Mess.

The Medical Section opened with a paper by Captain H. Meltzer, on the pulmonary manifestations of blast injury, with the presentation of x-rays and clinical cases. Discussion centred upon prevention and treatment. Captain Meltzer pointed out that severe degrees of pulmonary blast lesions might be overlooked in casualties with multiple injuries or shock, unless the condition and its importance is borne in mind.

Major W. H. P. Hill reviewed the cases of infectious mononucleosis which had been treated in this hospital; the chief discussion took place upon the frequency, and differential diagnosis, of the condition. Major Hill suggested that the incidence of skin manifestations depended partly upon the care taken in searching for this early in the course of the disease. He also pointed out that 3 of his 10 cases exhibited jaundice.

Major R. A. Palmer presented a patient with march hæmoglobinuria. Following extensive laboratory investigation in this individual, Major Palmer demonstrated, (1) raised plasma hæmoglobin; (2) lowered renal threshold for hæmoglobin.

The opinion was advanced that the hæmoglobin in the plasma at any one induced paroxysm did not exceed the amount which would be freed in the ordinary process of normal red cell replacement. The idea was put forward that temporary suspension of the mechanism for withdrawal of hæmoglobin from the plasma, and not hæmolysis, might account for the condition.

Lieut.-Col. H. S. Mitchell presented a review of all cases of infectious hepatitis (catarrhal jaundice) in the Canadian Army during the year July 1, 1941 to June 30, 1942. The most interesting point was the comparison between syphilitics under treatment, and the non-syphilitic group. It was found that 0.16%, of the total personnel were jaundiced during the year (excluding all causes other than infection) and that 5.84% of the syphilitics under treatment, were jaundiced. Thus the syphilitics under treatment developed jaundice 35.5 times as frequently as the non-syphilitics.

Serious complications were only slightly greater in the syphilitic group, (1.47% deaths from acute yellow atrophy in the syphilitics, 0.95% in the non-syphilitic).

(Sgd.) H. S. MITCHELL.

La société médicale des hôpitaux universitaires de Québec

Une séance a eut lieu à l'Hôpital Laval, Québec, le 20 novembre 1942. Suivent les résumés des travaux présentées.

"CARDIO-SPASME". — Louis Rousseau, Florian Trempe et Jean-M. Lemieux.

On rapporte le cas d'une jeune fille de 26 ans, qui, à la suite d'une thyreoidectomie développa un cardiospasme. Ce cardiospasme fut traité par une œsophagotomie extra-muqueuse.

Une analyse assez détaillée de la question est ensuite faite: anatomo-pathologie, étiologie, revue des traitements médicaux et chirurgicaux.

BRONCHOSCOPIE ET SYNDROME D'ATÉLECTASIE D'ORIGINE NÉOPLASIQUE.—G. Léo Côté.

Le cancer primitif du poumon semble plus fréquent qu'autrefois! Cette augmentation dans la fréquence de ce cancer est-elle réelle ou simplement relative et due à l'amélioration de nos moyens d'investigations et de diagnostic?

Le cancer primitif du poumon est, à son origine tout au moins, une tumeur de la bronche. Il se manifestera donc par une obstruction de la lumière bronchique, et objectivement et radiologiquement par un emphysème et surtout une atélectasie pulmonaire.

Le diagnostic précoce est d'une importance capitale: sur lui repose la survie ou la mort du malade. Ce diagnostic est basé surtout sur deux procédés d'examens: la radiologie et l'exploration bronchoscopique.

Suivent deux observations de cancer primitif du poumon, dont le diagnostic probable a été fait par la constatation radiologique d'une atélectasie pulmonaire, et confirmé par l'exploration bronchoscopique et l'examen anatomo-pathologique d'un fragment prélevé par biopsie.

AMIANTOSE PULMONAIRE.—Louis Rousseau.

L'amiantose pulmonaire se différencie de la silicose en donnant des images radiologiques moins caractéristiques. Son association à la tuberculose est fréquente ce qui explique que ces malades sont souvent hospitalisés dans des sanatoria. La recherche des corps d'amiante permet de faire le diagnostic d'amiantose alors que la clinique et la radiologie n'en fournissent aucun signe. L'amiantose pure n'est pas observée fréquemment.

Observation d'un malade ayant travaillé 18 ans dans l'amiante chez qui on ne trouve aucun signe de tuberculose; la radiographie montre un aspect marbré des deux poumons.

Les cas d'amiantose doivent être plus nombreux qu'on ne le croit et la possibilité d'une enquête chez les ouvriers travaillant dans cette industrie permettrait de se faire une opinion plus juste sur l'amiantose.

AMIANTOSE ET TUBERCULOSE PULMONAIRES. — Roland Desmeules et Maurice Giroux.

Les auteurs font part de l'observation d'un homme de 44 ans qui a travaillé pendant vingt ans dans l'industrie de l'amiante. Après environ dix années, il présente les premiers signes cliniques d'amiantose. Dix ans plus tard, il y a début apparent de la tuberculose pulmonaire. Le diagnostic de tuberculose est porté après examens cliniques, radiographiques et bactériologiques. L'amiantose est prouvée par l'histoire de l'occupation et la constatation de corps d'amiante dans les expectorations.

L'anatomo-pathologie permet d'établir le diagnostic certain d'amianto-tuberculose.

Les auteurs croient que l'amiantose a précédé la première poussée de tuberculose de surinfection et pensent que la pneumoconiose a pu diminuer la résistance générale et pulmonaire du malade et faciliter ainsi le réveil et l'envahissement du processus tuberculeux.

AMIANTOSE EXPÉRIMENTALE: VALEUR PATHOGNOMONIQUE DU CORPS D'AMIANTE.—Maurice Giroux.

Le travail présenté donne tout d'abord l'historique du corps d'amiante (curious bodies), puis sa constitution physico-chimique, et enfin son développement expérimental, tant *in vitro*, qu'après inhalation et inoculations à l'animal (cobayes, lapins, chien) de poussières d'amiante.

Le mécanisme de la formation du corps amiantique chez l'animal est étudié au point de vue histo-chimique, surtout au niveau du poumon.

1°—Les expériences chez l'animal indiquent que le corps d'amiante ne se forme qu'après une réaction tissulaire assez intense, et un apport substantiel de fer, fourni par l'hémoglobine.

2°—De plus, cette réaction tissulaire ne peut se faire sans un certain degré de fibrose, si minime soit-elle.

3°—Par conséquent, la présence de corps d'amiante dans les expectorations, ou encore dans un liquide obtenu par ponction du poumon, signifie amiantose pulmonaire au sens large du mot, mais sans nécessairement indiquer le degré de sclérose pulmonaire, dont le diagnostic sera élucidé par la clinique et la radiologie.

Une séance de cette Société eut lieu à l'Hôtel-Dieu de Québec le 4 décembre 1942. Suivent les résumés des études présentées.

CONSIDÉRATION D'UNE ÉTUDE STATISTIQUE PORTANT SUR 443 CAS D'ULCÈRE GASTRO-DUODÉNAL ET 228 CAS DE CANCER.—J. B. Jobin, J. P. Dugal et M. Guay.

On insiste sur certains points du traitement médical en particulier l'usage de la Larostidine qui parait être un adjuvant précieux, surtout pour les résultats éloignés. Les indications chirurgicales dans les ulcères du duodénum s'adressent à peine à 20% de ces malades et relévent surtout de la perforation, de la sténose, et, rarement, de l'échec du traitement médical. Pendant une hémorragie massive, il faut sans aucun doute éviter tout traitement chirurgical qui ne peut être appliqué que quand l'anémie aiguë, conséquence de l'hémorragie, aura été réparée.

Le diagnostic différentiel entre un ulcère et un cancer de l'estomac est très difficile car tous les signes sont trompeurs: clinique, laboratoire, radiologie, et endoscopie ne peuvent fournir aucun signe pathognomonique. S'il persiste le moindre doute sur la nature de la lésion, conseiller une gastrectomie.

RADIO-DIAGNOSTIC DE L'ULCÈRE GASTRO-PYLORO-DUODÉNAL.—J. Edmour Perron.

En 1906, Hemmeter, un médecin allemand, faisait des expériences destinées à faire voir des ulcères artificiels produits chez le chien et le lapin par les rayons X, puis réussissait à faire la même démonstration chez trois sujets porteurs d'ulcères vérifiés opératoirement.

En 1910, Haudek, un médecin de Vienne, décrivait les caractères radiologiques qui signalent la présence d'un ulcère dans l'estomac, et nous avons conservé depuis le signe radiologique le plus évident qu'il avait décrit sous le nom de "Niche de Haudek". Depuis beaucoup d'autres signes sont venus s'ajouter telles que l'incisure de caractère spasmodique, la grande motilité gastrique, la rétention post-prandiale, la douleur localisée, la déviation des plis de la muqueuse, etc.

La valeur de cette recherche s'est montrée d'une telle efficacité, surtout depuis les perfectionnements apportés par la sérialographie en ce qui concerne les ulcères du duodénum, que nous ne saurions considérer les affections du tube digestif sans l'utilisation du procédé radio-diagnostic. C'était l'opinion du professeur de clinique chirurgicale: Lord Moynihan, de Leeds, en 1925, et les deux dernières décades n'ont fait qu'ajouter à cette avancée.

CONSIDÉRATIONS SUR LE TRAITEMENT CHIRURGICAL DES ULCÈRES GASTRO-DUODÉNAUX.—Charles Vézina, François Roy et E. Samson.

On a étudié les dossiers de 188 malades qui furent opérés à l'Hôtel-Dieu de Québec, depuis dix ans, pour ulcère gastrique ou duodénal.

De ce nombre 57 ont été opérés pour ulcère gastrique ou duodénal perforé. Neuf sont morts. Des malades qui ont survécu à leur perforation, 70% ont continué à présenter des signes d'ulcère. Soixante-neuf ont subi une gastro-entérostomie pour ulcère duodénal. Qautre sont morts à la suite du mauvais fonctionnement de la bouche de gastro-entérostomie.

Les résultats éloignés sont les suivants: 53.2% en excellente santé; 15% améliorés; 32% dans le même état, c'est-à-dire présentant encore des signes d'ulcère.

Cinquante-trois malades ont subi une gastrectomie partielle: 5 sont morts; 85% peuvent être considérés comme guéris; 13% améliorés; et 2% ayant fait un ulcère jéjunal.

Correspondence

A Letter from Dr. W. B. Howell

To the Editor:

The many friends of Dr. W. B. Howell, McGill '96, lately Chief Anæsthetist at the Royal Victoria Hospital, Montreal, will be glad to hear of him again. Having decided to retire, he and his wife were sure that England would be an ideal place in which to live. They bought a thatched cottage in South Devon, installed modern plumbing, and were enjoying themselves when the war came in 1939. I enclose a letter in which he describes some of his experiences in his usual lively manner.

L. R. MORSE, M.D.

Lawrencetown, N.S.
December 17, 1942.

"Until last week I was going to Exeter once or twice a week to give anæsthetics at the Royal Devon and Exeter Hospital. It is an oldish institution dating back to 1746. Part of the original building is still in use and, as you may imagine, is none too convenient. There are some areas quite close to the hospital which were badly smashed up in the night raids early in the season. Such a scene of ruin! I had to do the trip, thirty-six miles there and back, by motor because my medical adviser didn't think I could stand the long waits which are inevitable nowadays if one travels even such a short distance by train or bus.

"I have stopped going to Exeter for the time being because our car, which we bought second hand five years ago, is in its extreme old age and we were afraid that it might break down on the way. With most of the garages closed and the buses crowded to excess this might be rather serious, especially if night were coming on. So now we are on the look-out for another second-hand car. They are very expensive just at present though most private cars are laid up because the owners can't get petrol.

Before very long I expect people will accept anything they can get for their cars because they will realize that it will be years before they can be used for pleasure. It will be years before England will have foreign exchange to pay for anything but the necessities of life. Nor will car owners have money for anything else than paying income tax. I have no difficulty in getting petrol, because I am a doctor and doctors are in great demand just at present. It was announced the other day over the wireless that more are being called up for the forces. When one or two more members of the staff of the Torbay Hospital are called up I shall have to work there more than my present two days a week.

"We are achieving an unenviable notoriety here by our visits from Hun aeroplanes. There is no need to go into details. You will probably have read about them in your daily paper. We have had as many as six planes here at one time. They come and are gone in less than a minute. The first sound you hear is very loud and rude machine gun fire, then bombs bursting and then in a few minutes the sound of the siren. The idea of the siren sounding then is so that you won't think Jerry was fooling. If you have a ton of bricks resting on your chest the siren tells you that the cause of that feeling of respiratory oppression was a bomb. Anyway the sound will cheer you if you hear it as you waddle up the golden stairs. Not even the most enthusiastic fire-eater would say that air raids are pleasant. What they are like in Germany when they last for hours I can't imagine. I can remember a time when one looked at soldiers who had been under fire and thought they were heroes. But not now. Any woman or child you see in England has probably had that experience.

"The vagaries of bombs are certainly queer. In one of our raids here there was a woman on the second floor of a house that had a direct hit. The house collapsed and she and the two children who were with her came forth unscratched. An A.R.P. official told me that one night when there was an alarm he got out of bed and went to his post. Well for him he did. A bomb exploded a quarter of a mile away and threw a piece of masonry through the side of his house. It fell on his bed and squashed it flat. A man was very close to an exploding bomb. He was mighty pleased to find he wasn't hurt, but thought it queer that he should have four hard substances on his tongue. He spat them into his hand and found that they were the crowns of four of his teeth! At our last raid, Ronald Coldrey, my doctor, had most of the glass in the windows of his house blown in. He was out but his secretary was in. She was sitting at his desk when she heard suspicious sounds. She moved away from the window which, a second later, was blown in. The glass would have cut her badly. Sometimes there is an element of tragedy in these little affairs. At one of the churches stuff was being collected for a jumble sale. A woman came in wheeling a perambulator with a bundle of infant's clothes in it. She explained that her baby had been killed in a raid and she had no further use for the perambulator and the clothes. Her husband had been killed earlier in the Near East.

"These raids serve a useful purpose for us. They keep us interested in the war. They make us realize that this time it is a fight to a finish and when the nice kind statesmen start putting Germany on her feet after the war we shall boot them out and put people with good red blood in their place. Not of course that I am one to harbour malice. But I do think that the bully must have both his legs broken so that he can't get around too easily.

"I haven't seen any American soldiers yet. The first one I come across I shall invite here and tell him that I can give him a cup of coffee as it is made in the U.S.A. English coffee is appalling. Every one around here who has tasted Jean's coffee has gone into raptures about it."

W. B. HOWELL.

South View, Shaldon, South Devon.
September 3, 1942.

Post-war Child Relief in Europe

To the Editor:

I would be grateful if you would publish the enclosed communication from the British Pædiatric Association. The letter is self-explanatory, and its publication will enable the groups of pædiatrists in Canadian cities to which this letter makes an appeal, to communicate directly with Dr. Lightwood, the local secretary of the sub-committee.

On behalf of the Canadian Society for the Study of the Diseases of Children, I am replying that as a group, we are interested in the idea set forth, and await further details regarding the duration of service, personnel required for such units, financial support, etc.

Yours sincerely,

R. R. STRUTHERS.

Drummond Medical Building,
Montreal, December 30, 1942.

CONTINENTAL CHILD RELIEF

"Dear Sir,

You will remember that at the British Pædiatric Association meeting at Windermere in the summer, the question of how the British Pædiatric Association could help the children of post-war Europe was raised.

The problem is a vast one, involving many countries and millions of children in famine conditions with its associated diseases. Europe will lack the pædiatric personnel to tackle the problem and hence it is felt that a large number

of pædiatric units (doctors and nurses) will have to be sent out to help the authorities in the different countries and cities to get their children's services working again. We would like to hear if your Children's Hospital or Department would be willing to organize the personnel of such an unit.

We fully realize that the matter is one which will require much thought and organization but we would be glad if you would discuss it with your colleagues and let us know what you think, and if you have any other suggestions to make in this connection.

The committee is at present in touch with the authorities in London who are planning post-war relief, and your early reply would be most helpful.

Sincerely yours,

DONALD PATERSON,
Locum Secretary.

All communications relating to this matter to be referred to Dr. R. Lightwood, Local Secretary, at the address given."

The British Pædiatric Association,
27, Devonshire Place,
London, W.1,
November 16, 1942.

Manual on Chemical Warfare

To the Editor:

A Manual on the medical treatment of gas casualties is now being printed by His Majesty's Stationery Office, in London, and it is expected that it will be ready in the near future. It will be known as "Medical Manual for Chemical Warfare" and in it will be incorporated all of the latest medical developments of practical value. Particular attention is drawn to use of amyl salicylate for treatment of mustard gas blisters; use of a solution for treatment of eye casualties caused by mustard gas vapour and use of "Anti-Arsenical Lotion" for treatment of eyes and skin contaminated with arsenical blister gases and mixtures of mustard gas and arsenical blister gases. This lotion, if applied properly and at the proper time, is not only effective locally, but is also effective in counteracting the systemic poisoning effects of these gases.

I am authorized by Dr. R. J. Manion, Director of Civil Air Raid Precautions, to say that every hospital in the large centres of Canada will receive a copy of this Manual, and that every physician who enrolls in any one of the Civil Air Raid Precaution organizations in Canada will receive one of these manuals free of charge through his Provincial or Municipal A.R.P. organization.

The supply of these Manuals in Canada will be limited. Therefore, they will be available to the medical profession generally only after the hospitals and A.R.P. physicians have received their copies.

I. M. RABINOWITCH,
Scientific Adviser on Chemical Warfare, Office of the Director, Civil Air Raid Precautions, Ottawa.

Ottawa, January 9, 1943.

Special Correspondence

The London Letter

(From our own correspondent)

THE BEVERIDGE REPORT

Over 100,000 words on social insurance and allied services need some digestion and only a few days after publication it is still too early to report on all the medical implications of Sir William Beveridge's great contribution to progress. "A revolutionary moment in the world's history is a time for revolutions, not for patching"—so runs an early remark which may serve as a text for the whole.

Perhaps to the individual doctor the greatest change is that he will have to buy insurance stamps for himself, as an essential part of the scheme is that all classes of the community will be insured for security appropriate to their circumstances. To the profession in general the likely changes are indicated in the paragraph: "Medical treatment covering all requirements will be provided for all citizens by a national health service organized under the health departments, and post-medical rehabilitation treatment will be provided for all persons capable of profiting by it". Exactly what this means in detail is too complex for summary here. Problems of organization are as complicated as those of finance. Certainly nothing is said to indicate the end of the voluntary system as regards the hospitals nor, although all the population will be contributing towards health insurance, is it contemplated that private practice will necessarily be abolished. But it is interesting and some would say ominous that the report should state in this connection—"The possible scope of private general practice will be so restricted that it may not appear worth while to preserve it".

These, then, are some preliminary comments on what some enthusiasts have described as the greatest British document since Magna Charta.

VENEREAL DISEASE

The sharp increase in venereal disease in the past year has caused the authorities some anxiety, and in an effort to deal with the problem of the prostitute or amateur who neglects

treatment a new defence regulation introduces a scheme which is coming in for considerable criticism. Briefly, a practitioner recognized as skilled in the treatment of venereal disease who receives information from a patient as to the likely source of infection, is bound to report this to the appropriate medical officer of health. If the latter gets such reports showing that two or more patients have been infected from the same source he can require the person concerned to attend for examination and treatment.

From the point of view of a drastic measure to deal with an infectious disease this regulation can be justified, but it introduces an unfortunate principle into law—namely by encouraging the "informer", generally a despicable type and likely to be a blackmailer as well. Moreover, when treatment is concluded a clearance certificate is to be given which may lead to grave dangers if it is used by prostitutes as a sort of "carte", indicating freedom from disease which may be true or not depending upon the time which has elapsed. Some critics think that the compulsion suggested does not go far enough and that all sufferers should be forced to receive treatment until passed as cured. Others feel that the whole regulation is unfair to the source of infection, as there is apparently no redress for anyone who is wrongfully accused.

In the next few days both Houses of Parliament will be discussing the regulation, and modifications are possible. Whatever happens, however, all progressive thinkers are clear that more effort is needed to attack the problems. More propaganda, more venereal disease treatment clinics, and more social workers in such clinics represent a truly forward policy.

THE DOCTOR'S HEALTH

Perhaps licking insurance stamps for the Beveridge social service will make the medical practitioner think more about his own health, a subject on which he is notoriously careless. Recently a physician of great experience in this subject—as referee to an insurance company dealing only with doctors and dentists—summed up his views on this subject. He showed that, taking the ages 30 to 65, three out of four doctors survive until the limit of this insured period. The causes of early death among doctors are listed and the first four are cardiovascular degeneration, malignancy, pneumonia and coronary thrombosis, in that order.

Illness among doctors has also been analyzed: no account is taken of illnesses of less than seven days. In the year 1938, 1,620 out of 8,884 doctors were ill for over a week, about 1 in 5½. The first three on the list of causes of illness are respiratory infections, influenza and accidents. This strongly suggests that the present campaigns against sneezing and against road accidents might improve the health of the medical profession! The analysis deals particularly with the often quoted view that coronary thrombosis is a disease to which doctors are especially prone, and sternly challenges this conclusion.

The figures in general are small, but the broad outline is of interest and compares favourably with the population at large.

ALAN MONCRIEFF

London, December, 1942.

Miscellany

The Dunkirk Wounded

[From *The Lancet*, Nov. 21, 1942, p. 627]

The story of the wounded who came back from Dunkirk has long been known. Far less is known about their more unfortunate brothers who, in addition to being wounded, had the misfortune to be taken prisoner. At a rough estimate there must have been some seven or eight thousand of them who lived to be taken into the hands of the German medical services. They were collected and housed in hospitals, schools, barracks and public halls throughout France and Belgium. There were British wounded in Rennes, Rouen, Paris, Lille, Bethune, Hazebrouck, Brussels, Malines, Zuydcote, Bruges, Namur, Ghent, Amsterdam, Enghien and many other places. The wounded remained in occupied territory for up to eight months; the last large batch to leave for Germany were the badly wounded of the 51st Division, who left France in late February, 1941. Stories from the different groups of men gave conflicting reports regarding their condition and treatment. It was my privilege, among many other doctors, to stay behind with the wounded; and during the first six months I worked under conditions varying from very bad to good. It is unnecessary to describe the appalling conditions which had to be endured during the days just before and after capture. Shortage of water, food and shelter was, in many places, acute, and that alone may indicate what hardships the wounded had to bear. Gradually conditions improved as they were moved away from the battle areas into centres where water, food and medical treatment were obtainable. In some cases the improvement was comparatively small—many spent three or four weeks on the same filthy stretcher and lived on a diet of black bread and beans. I remember arriving at a hospital one night with a convoy of 350 badly wounded cases. There was no room in the hospital, so the stretchers were placed in gutted sheds, and the only equipment with which we

were provided during the night was one small saucepan of soup and three phials of morphia.

In early July, 1940, some fifty compound fractures of the lower limbs were sent to Brussels and I had the luck to accompany them. Here we were received into a most efficient hospital with a bungalow pavilion to ourselves. There were separate eight-bedded wards, spring beds and a good operating theatre and portable x-ray apparatus. It was staffed by fully trained Belgian nurses. The food was excellent and the medical equipment good. The immediate improvement in the morale of the patients and in the healing of their wounds was as remarkable as were the conditions themselves. Two months later I left for Malines where some two hundred British wounded were housed in dark damp barrack rooms. The food was quite inadequate and of poor quality. The patients were pale and solemn and their wounds showed little tendency to heal. Most of the wounded throughout the occupied territories were fed on a low maintenance diet which was far from sufficient to support the proper healing of wounds. They were, therefore, dependent on their friends in the occupied territories for extra food. Thanks to the energy, ingenuity and courage of these people the goods were delivered. In most places the Germans forbade visitors or parcels to reach the British wounded, but this only stimulated the influx of the most nourishing food that could be found. A great deal is owed to the people of Northern France and Belgium who risked so much to save our wounded. Many stories of bravery and self-sacrifice could be told of women who feared nothing so long as their parcels reached the patients.

Gradually, as the war developed into a more serious affair for our opponents, those in the occupied territories were evacuated into lazarets and camps in Germany. Here, the conditions were uniformly poor. There was overcrowding and inadequate food and medical equipment. Nevertheless, the men rose to the occasion. Their morale was good. Physical training and rehabilitation classes were started and joints began to move for the first time in six months. The British Red Cross parcels began to arrive in January, 1941, and these did more than anything else in helping the wounded to get well. In one camp, charts of weight, vitamin-deficiency symptoms, hæmoglobin percentage and blood-pressures were kept before and after each parcel distribution. The results showed an astounding improvement at first followed by a steady improvement as other parcels arrived. Artificial limbs were made by our own men out of pieces of wood, plaster-of-paris, jam tins and other odds and ends. One noted firm known as Cook, Cripps and McDonald, in which Cook did the plaster work, Cripps the metal and McDonald the wood-work, made over a hundred artificial limbs. These were tough enough to allow the amputees to box or play football and basket ball.

In September, 1941, the Repatriation Scheme suddenly raised its fair head over the horizon, and all those—some 1,400—who had passed the Mixed Medical Commission were collected together for going home. The centre rendezvous was a small village, and here the wounded spent three days and nights in an open field. Two long and well-equipped trains eventually arrived and a journey, which must have been one of the happiest ever, began. Each man was issued with a whole Red Cross parcel for two days, which was far more than enough. When the trains entered Belgium and later France the tracks were lined with crowds of people waving and giving the "thumbs up" and victory sign. Our men had not forgotten them. Now it was their turn to give to those who had helped them before. They threw the contents of their parcels into the crowds. This continued throughout Belgium and France. Handkerchiefs waved, kisses were blown and eyes were moist as the people stood three and four deep to watch the "Tommies" go past. Needless to say, everyone arrived in Rouen with empty haversacks and smiling faces. They eagerly searched for the signs of a boat but there were none. As days passed and no boat appeared, faces grew longer and longer. Eventually the truth was obvious, the disappointment colossal and once again our men had to swallow hard, pull in their belt, hitch up their wooden legs and say "C'est la guerre." During last December and February they left Rouen for Germany and Poland and once again said "Au revoir" to their friends in the occupied territories, but their spirit was fine and will last to the end.

Experience shows how incredibly difficult it is to get men really to encourage the principle of originality. They will admit it in theory, but in practice the old error—the error which arrested a hundred civilizations—returns again. Men are too fond of their own life, too credulous of the completeness of their own ideas, too angry at the pain of new thoughts, to be able to bear easily with a changing existence; or else, *having* new ideas, they want to enforce them on mankind—to make them heard, and admitted, and obeyed before, in simple competition with other ideas they would ever be so naturally.—Walter Bagehot: "Physics and Politics", p. 59.

Canadian Medical War Services

NOMINAL ROLLS OF MEDICAL OFFICERS IN THE CANADIAN FORCES

We are glad to be able to publish further lists of medical officers in the three Services. These include the names already published in our Journal, and we have been enabled to do it by the ready co-operation of the respective Directors-General.

In the case of the R.C.A.M.C. the names are shown in Sections, but it is hoped to combine them in one continuous list at a later date.
—EDITOR.

ROYAL CANADIAN NAVAL SERVICE AS AT JANUARY 1, 1943

Surgeon-Captains

Anderson, A. L., Saskatoon, Sask.
Johnstone, D. W., Regina, Sask.
Laroche, A. G., Montreal.
McCallum, A., Toronto.

Surgeon-Commanders

Amos, E. A., Montreal.
Best, C. H., Toronto.
MacCharles, C. W., Winnipeg.
Morton, H. S., Montreal.
Webster, D. R., Montreal.

Surgeon-Lieutenant Commanders

Bacal, H. L., Montreal.

Chisholm, G., Montreal.
Currie, M. A., Regina, Sask.

deBelle, J. E., Montreal.

Farmer, T. D. F., Montreal.
Fisher, C. M., Kitchener, Ont. (Prisoner of War)

Giffin, A. A., Kentville, N.S.
Gorrell, D. S., Regina, Sask.
Graham, J. W., Toronto.
Grant, G. H., Windsor, Ont.

Lewis, J. A., London, Ont.
Little, J. L., Guelph, Ont.
Little, L. P., Ottawa, Ont.

Marshall, A., Tranquille, B.C.
MacDonald, S. A., London, Ont.
MacKenzie, W. C., Edmonton, Alta.
MacLeod, J. W., Montreal.
McClelland, J. H. C., Mimico, Ont.
McEuen, C. S., Montreal.
McKay, A. L., Toronto.
McLean, T. B., Edmonton, Alta.
McNamee, F. P., Kamloops, B.C.
Mitchell, D. R., Toronto.
Mitchell, D. S., Montreal.

Oake, C. M., Oakville, Ont.

Paton, W. M., Vancouver.
Peirce, C. B., Montreal.
Philpott, N. W., Montreal.

Ruttan, H. R., Victoria, B.C.

Solandt, D. Y., Toronto.
Starkey, D. H., Montreal.

Thomson, R. K. C., Edmonton, Alta.
Verity, G. E., Brantford, Ont.
Viger, J. R., Montreal.

Wellman, M. C., Whitby, Ont.
Welsh, W. K., Toronto.

Yoerger, R. G., Humboldt, Sask.

Surgeon-Lieutenants

Alford, E. L. G., Ottawa, Ont.
Arber, S. R., Port Arthur, Ont.
Arbuckle, J. W., Vancouver.
Archibald, W. S., Kamloops, B.C.
Atcheson, J. D., London, Ont.

Baker, H. G., Vancouver.
Bean, D. M., Waterloo, Ont.
Bingham, J. R., Winnipeg.
Blundell, S. F., Victoria. B.C.
Bonnycastle, D. D., Toronto.
Bourne, R. A., Montreal.
Bowers, N. H., North Bay, Ont.
Breckenridge, W. G., Peterborough, Ont.
Brooke, H. H. W., Ardath, Sask.
Brooks, C. E., Lachine, Que.
Burnett, W. H., Toronto.
Burns, R. E., Trail, B.C.

Cadman, T. A., Baie Verte, N.B.
Calder, J., Edmonton, Alta.
Cameron, J. D., Toronto.
Campbell, A. D., Weyburn, Sask.
Campbell, B. A., Strathroy, Ont.
Campbell, C. G., Hamilton, Ont.
Chambers, A. L., Edmonton, Alta.
Chapman, G. W., Simcoe, Ont.
Chisholm, H. A., Montreal.
Chivers, N. C., Vancouver.
Church, A. C., Montreal.
Clark, A. W., Sussex, N.B.
Clark, J. W., Bethany, Ont.
Collins, W. E., Beachburg, Ont.
Cooke, R. L., Wolseley, Sask.
Cooper, E. A., Shawinigan Falls, Que.
Cotnam, H. B., Pembroke, Ont.
Cram, E. J., Montreal.
Cram, R. H., London, Ont.
Crutchlow, E. F., Montreal.
Crysler, W. E., Simcoe, Ont.
Cunningham, W. F., Port Arthur, Ont.

Danby, C. W., Kingston, Ont.
Davis, T. G. T., Gananoque, Ont.
Delorme, E. J.,
Denton, R. L., Montreal.
Dickie, E. D., Digby, N.S.
Dingwall, M., Kingston, Ont.
Dixon, D. H., Winchester, Ont.
Dixon, G. D., Toronto.
Dodds, J. R., Summerside, P.E.I.
Dupuis, R., Verdun, Que.

Eggers, H. E., Omaha, Nebraska.
Elliott, J. F., Rochester, Minn.
Elliott, Walter J., Parksville, B.C.
Ellictt, William J., Brandon, Man.

Fahrni, G. P., Winnipeg.
Farish, H. G., Vancouver.
Fields, W. S., Montreal.
Flatt, W. D., Toronto.
Fleming, J. H., Toronto.
Forsey, R. R., Toronto.
Fortye, R. A., Kingston, Ont.
Fraser, R. H., New Waterford, N.S.
French, D. B., Toronto.
Frost, J. W., Vancouver.
Frost, M. H., Vancouver.
Fry, W. R., St. Thomas, Ont.
Fyfe, J. G., Winnipeg.

Garten, K. A., Halifax, N.S.
Gayman, G. R., Vineland, Ont.
Gee, E. M., Winnipeg.
George, M. B., Tweed, Ont.
Gibson, J. W., Toronto.
Gould, G. A., Uxbridge, Ont.
Gray, J. C., Halifax, N.S.
Green, L. S., Stoney Creek, Ont.
Grisdale, C. J. M., Kirkland Lake, Ont.

Hackney, J. W., Calgary, Alta.
Hallam, B. H., Saskatoon, Sask.
Hart, W. J., Winnipeg.
Hebb, H. D., Halifax, N.S.
Hill, M. B., Timmins, Ont.
Hisey, L. G., Toronto.
Hitchin, E., Edmonton, Alta.
Hoogstraten, J., Winnipeg.
Howitt, C. W., Guelph, Ont.
Hunt, E. A., Bury, Que.

Irvine, C. E., Timmins, Ont.

Jacks, Q. D., Brandon, Man.
Jarry, G., Montreal.
Johnson, A. L., Montreal.
Johnston, D. R., Kingston, Ont.
Johnston, J. L., Stratford, Ont.

Keeley, C. D., Essex, Ont.
Keith, J. D., Toronto.
Kelly, R. G. C., Toronto.

Surgeon-Lieutenants—*Continued*

Kennedy, J. C., London, Ont.
Kerr, J. R., Fox River, N.S.
King, W. L. M., Toronto.
Kinsey, F. E., Niagara Falls, Ont.
Kirk, C. M., Montreal.

Laing, W. R., Montreal.
Lane, R. A. G., Toronto.
Large, G. E., Kingston, Ont.
Learmonth, C. M., Toronto.
Lee, E. H., Saskatoon, Sask.
Levesque, P., Levis, Que.
Little, M. H., Haileybury, Ont.
Locke, W., Winnipeg.
Lotimer, L. E., Toronto.
Love, W. D., Penticton, B.C.
Lynch, J. B., Sydney, N.S.

MacCharles, E. D., Medicine Hat, Alta.
MacDonald, C. C., Montreal.
MacDonald, R. M., Sydney, N.S.
MacHattie, F. G. W., Toronto.
MacInnis, H. F., Souris, P.E.I.
MacIntosh, D. L., Waverley, N.S.
MacKinnon, A. G., Toronto.
MacKinnon, H. H., Toronto.
MacLennan, J. G., Edmonton, Alta.
MacMillan, A. A., Ottawa, Ont.
MacMillan, R. L., Toronto.
McArthur, J. R., Toronto.
McCallum, A. J. C., Winnipeg.
McCarten, A. B., Winnipeg.
McCausland, M. D. J., Toronto.
McCormack, J. T., Toronto.
McCoy, E. C., Huntingdon, Que.
McCulloch, J., Ottawa, Ont.
McCurrach, A. C., Kamloops, B.C.
McCutcheon, J. V., Toronto.
McFarlane, D. H., Winnipeg.
McIntyre, R. W., St. Mary's, Ont.
McKenzie, R. B., Newcastle, N.B.
McLachlan, J. A., St. Thomas, Ont.
McLandress, M., Winnipeg.
McLaren, D. K., Toronto.
McLennan, T. M., Sunderland, Ont.
McRae, D. L., St. Mary's, Ont.
McRitchie, M., Fernie, B.C.
McRoberts, A. F., North Bay, Ont.
Mathisen, A. K., Sidney, B.C.
Maughan, G. B., Montreal.
Mepham, T. E., Hamilton, Ont.
Michon, J. J., Montreal.
Mighton, A. K., Fergus, Ont.
Millar, R. D., Vancouver.
Moore, C. A., Westboro, Ont.
Moore, C. H., Brandon, Man.
Moore, J. R., Saint John, N.B.
Mores, G. P., Calgary, Alta.
Murray, J. M., Ottawa, Ont.

Nelles, S. B., Douglas, Isle of Man.

O'Brien, M. J., Ottawa, Ont.
Overend, F. B., Hamilton, Ont.

Paddon, W. A., Northwest River, Labrador.
Pain, A. M., Hamilton, Ont.
Palmer, J. D., Fredericton, N.B.
Parker, J. M., Winnipeg.
Prowse, L. E., Charlottetown, P.E.I.
Putnam, J. M., Eldon, P.E.I.

Rathbun, J. C., Toronto.
Renshaw, H. V., Hamilton, Ont.
Rice, W. G., Toronto.
Richardson, O. B., Woodstock, Ont.
Robb, J. P., Montreal.
Rogers, J. W., Kingston, Ont.
Ross, A., Montreal.
Ross, J. D., Edmonton, Alta.
Ross, R. C., Vineland Station, Ont.
Russell, J. L., Toronto.

Saint-Martin, J., Montreal.
Schwager, P. G., Saskatoon, Sask.
Scott, J. W., Toronto.
Scully, F. J., Montreal.
Sellers, E. A., Winnipeg.
Silversides, J. L., Toronto.
Sinclair, J. W., Warrenton, Virginia.
Small, J., Toronto.
Smith, A. G., North Bay, Ont.
Smith, C. G., Toronto.
Smith, J. R., Dominion, N.S.
Stapleton, J. G., Hamilton, Ont.
Stoddard, C. C., Halifax, N.S.
Swan, H. G., Toronto.
Swan, R. S., Calgary, Alta.

Tait, W. M., Montreal.
Terwillegar, N. A., Edmonton, Alta.
Teskey, W. L., Sarnia, Ont.
Thompson, W. J., Humboldt, Sask.
Topping, F. O., Midland, Ont.
Townsend, R. G., Montreal.
Treffry, C. J., Norwich, Ont.
Trottier, A. E., Windsor, Ont.
Tweedie, F. J., Chatham, N.B.

Vaughan, A. M., Toronto.
Vaughan, C. E., Hamilton, Ont.

Walker, G. R., Toronto.
Wallace, W. B., Toronto.
Walters, L. J., Ottawa, Ont.
Ward, C. S., London, Ont.
Watson, J. L., Toronto.
Watson, T. P., Mount Royal, Que.
Weare, W. G., Niagara Falls, Ont.
Wheelock, G. H., Wolfville, N.S.
Whitehead, R. G. D., Winnipeg.
Whitelaw, D. M., Vancouver.
Wilson, C. C., Calgary, Alta.
Wilson, C. L., Montreal.
Wilson, F. H., Englehart, Ont.
Wilson, G. L., Edmonton, Alta.
Wilson, J. R., Peterborough, Ont.
Wilson, R. J., Toronto.
Wilson, T. V., Fergus, Ont.
Woolhouse, F. M., Saskatoon, Sask.
Worral, J. D., Keene, Ont.
Wylde, E. W., New Westminster, B.C.

Young, F. M., Seeley's Bay, Ont.

ROYAL CANADIAN ARMY MEDICAL CORPS—ACTIVE FORCE

As at November 30, 1942

SECTION I

Name	Address	Date of Appointment
Aber, S.	Montreal	27-7-42
Abbott, C. F.	Toronto	31-1-40
Adams, D. S.	Whitby, Ont.	1-10-42
Adams, F.	Windsor, Ont.	30-10-40
Adams, H. R.	Long Branch Ont.	23-7-41
Adams, J. H. F.	Straffordville, Ont.	25-10-41
Adamson, J. D.	Winnipeg	1-11-42
Agro, C. F.	Hamilton, Ont.	15-6-42
Albert, D. J.	Edmundston, N.B.	1-9-42
Albert, J. P.	Montreal	10-6-42
Albert, S. S.	Outremont, Que.	9-11-42
Albert, S.	Outremont, Que.	17-8-42
Alcorn, D. E.	Victoria, B.C.	18-8-41
Allen, J. L.	Calgary, Alta.	24-2-41
Alleyn, G. G.	Quebec	19-5-41
Anderson, C. E.	Brooks, Alta.	15-1-41
Anderson, J. J.	Regina, Sask.	2-2-42
Anderson, R. E.	Ashton, Ont.	25-7-42
Andreae, A. J.	Toronto	24-6-40
Appleford, R. D.	Hamilton, Ont.	24-6-42
Appleyard, H. E.	Hamilton, Ont.	21-9-42
Archibald, E. W.	Montreal	8-7-40
Archibald, W. S.	Edmonton, Alta.	26-6-42
Argue, A. F.	Montreal	7-10-40
Argue, H. H.	Mount Forest, Ont.	18-6-41
Armitage, T. F. H.	Vancouver	1-10-42
Armour, W. E.	Toronto	1-5-42
Armstrong, A. R.	Burlington, Ont.	12-1-42
Arnold, W. C.	Ottawa	22-9-39
Astrof, S.	Westmount, Que.	4-9-40
Atkinson, H. S.	Portage La Prairie, Man.	17-12-40
Atkinson, W. L.	Thornburg, Ont.	10-3-41
Auckland, N. L. D.	Vancouver	15-8-42
Austin, W. E.	Hazelton, B.C.	1-9-42
Austmann, K. J.	Winnipeg	22-4-41
Babb, F. S.	London, Ont.	23-8-42
Bailey, A. A.	Ottawa	17-9-42
Baird, H. E.	Chipman, N.B.	10-6-40
Baird, W. S.	Vancouver	18-6-40
Baker, C. H.	Middle Musquodobat, N.S.	3-2-41
Baker, M. D.	New Toronto, Ont.	29-5-41
Balfour, J. D.	London, Ont.	17-7-40
Ball, J. R.	Chapleau, Ont.	23-7-42
Bapty, W.	Victoria, B.C.	27-1-42
Barclay, L. T.	Toronto	9-10-42
Barrette, E.	Dorchester City, Que.	29-3-41
Bateman, J. E.	Toronto	17-10-42
Bean, S. J. T.	London, Ont.	24-4-41
Beattie, A. N.	Vancouver	20-7-42
Beattie, H. A.	Montreal	5-10-42
Beattie, J. H.	Clinton, Ont.	7-4-42

Name	Address	Date of Appointment
Beauchamp, A. J.,	Edmonton, Alta.	17-10-42
Beaudin, A. D.,	St. George de Beauce, Que.	15-11-41
Becker, A.,	Davin, Sask.	27-8-42
Beech, A.,	Salmon Arm, B.C.	1-6-42
Beevor-Potts, C. H.,	Goubou, B.C.	22-2-42
Begg, H. N. C.,	Cadomin, Alta.	27-9-40
Begg, R. W.,	Halifax, N.S.	13-5-42
Belanger, J. E.,	Hull, Que.	21-9-42
Belanger, P. A.,	Ottawa	25-5-40
Belcourt, R. J. P.,	Quebec	21-5-42
Bell, A. M.,	Alvinston, Ont.	10-2-41
Bell, C. G.,	Lions Head, Ont.	4-6-41
Bell, P. C.,	Winnipeg	22-5-40
Bell, R.,	Bala, Ont.	26-10-42
Bell, R. E.,	Edmonton	17-10-42
Bell, W. W.,	Victoria, B.C.	1-8-41
Bellemare, G. E.,	Vaudreuil Co., Que.	1-8-42
Belyea, C. C.,	Kitchener, Ont.	16-7-40
Benaron, T.,	Fort William. Ont.	11-9-39
Bennett, S. J.,	Inverness, Que.	12-3-42
Bennett, W. J.,	Winnipeg	3-6-42
Berbrayer, P.,	Winnipeg	10-9-42
Bernstein, L. L.,	Westbrook, Conn.	3-7-42
Berry, J. R.,	Toronto	7-7-41
Bews, D. C.,	Carleton Place, Ont.	31-3-42
Biehn, J. T.,	Sarnia, Ont.	8-9-41
Bigelow, W. G.,	Toronto	18-8-41
Billings, R. M.,	Cayuga, Ont.	10-6-42
Bird, E. S.,	Gananoque, Ont.	1-11-41
Bird, G. A.,	Victoria, B.C.	24-4-41
Bird, S. B.,	Liverpool, N.S.	1-11-42
Bissell, E. S.,	Mallorytown, Ont.	13-2-41
Black, B. O.,	Fredericton, N.B.	14-5-41
Blackadar, K. K.,	Halifax, N.S.	1-4-42
Blair, N. J.,	Sutherland, Sask.	16-3-42
Blakely, H. W.,	Kingston, Ont.	18-6-42
Blakeman, F. W.,	Ottawa	1-7-40
Blanchard, A. J.,	Hamilton, Ont.	10-4-42
Blois, G. M.,	Toronto	1-4-42
Bloomberg, M. W.,	Montreal	5-1-42
Blott, G. R.,	Edmonton, Alta.	16-9-42
Boodington, G. D. M.,	Toronto	19-3-40
Boettger, R. F.,	Collingwood, Ont.	3-11-42
Borden, R. P.,	Penticton, B.C.	12-7-40
Borrowman, A. M. W.,	Sarnia, Ont.	30-8-42
Borthwick-Leslie, K. V.,	Winnipeg	10-7-42
Boulanger, J.,	Riviere-du-Loup, Que.	21-5-42
Boulding, C. R.,	Aurora, Ont.	22-7-41
Boult, G. F.,	Winnipeg	20-6-41
Bourbonnaid, A. E.,	Coteau du Lac, Que.	6-7-42
Bourgeois, C. R.,	Tracadie, N.B.	30-6-42
Bourne, G. R.,	London, Ont.	2-7-42
Bowen, F. H.,	Windsor, Ont.	5-12-40
Bowen, R. J.,	Lambeth, Ont.	31-5-41
Bowie. M. R.,	Essex, Ont.	1-10-41
Boyd, R. W.,	Calgary, Alta.	24-3-42
Brace, W. D.,	Marsden, Sask.	20-5-41
Bracken, E. J.,	Gananoque, Ont.	25-9-41
Bradley, R. J.,	Orillia, Ont.	28-9-42
Brady, P. L.,	Seaforth, Ont.	21-9-42
Brebner, C. N.,	Belleville, Ont.	16-6-41
Brennan, J. W.,	Toronto	21-6-40
Brereton, D. C.,	Winnipeg	1-6-42
Breslin, W. I.,	Toronto	2-7-42
Bridge, R. C.,	Assinaboia, Sask.	20-8-42
Brien, F. S.,	Windsor, Ont.	6-9-42
Bromley, A. J.,	Toronto	17-8-42
Brook, J.,	Saskatoon, Sask.	3-9-42
Broome, A. E.,	Kitchener, Ont.	26-5-41
Brown, H. A.,	Toronto	14-1-40
Brown, J. F. L.,	Woodstock, N.B.	3-6-41
Brownlee, T. I.,	Russell, Man.	24-2-42
Brown, W. H.,	Toronto	6-12-40
Brownridge, T. R.,	Broadview, Sask.	19-2-40
Brunet, A. J.,	Montreal	20-9-39
Brunton, J. F.,	Hamilton, Ont.	19-5-41
Buck, H.,	Ottawa	20-6-40
Buell, A. L.,	Vancouver	1-6-42
Burkell, R. C.,	Regina, Sask.	1-7-42
Burleigh, H. C.,	Bath, Ont.	12-7-40
Burris, S. M.,	Winnipeg	11-8-41
Bustin, H. B.,	Saint John, N.B.	2-9-39
Butler, K. C.,	Ottawa	25-5-40
Butt, W.,	Niagara Falls, Ont.	1-5-42
Byers, W. M.,	Metcalfe, Ont.	8-6-42
Byrne, C. J.		8-6-42
Byrne, U. P.,	Essondale, B.C.	15-8-42
Cahill, F. C.,	Perth, Ont.	6-8-42
Cairns, R. M.,	Ottawa	24-2-41
Caldwell, A. L.,	Saskatoon, Sask.	27-12-41
Calhoun, J. C.,	Toronto	7-3-41
Calnek, S. H.,	Saint John, N.B.	17-2-41
Cameron, H. M.,	Ottawa	1-9-39
Campbell, D. R.,	Parry Sound, Ont.	16-9-40
Campbell, D. R.,	London, Ont.	21-2-42
Campbell, J. G. D.,	Halifax, N.S.	18-1-40
Cant, D.,	Stephenville Crossing, Nfld.	11-9-42
Carnat, M.,	Ponoka, Alta.	14-10-41
Carr, L. A. Jr.,	Hamilton, Ont.	31-5-41
Carroll, L. H.,	Haliburton, Ont.	26-10-42
Carruthers, W. L.,	Mount Albert, Ont.	29-11-40
Carson, W. H.,	Southampton, Ont.	4-6-41
Cass, I. M.,	Toronto	22-4-42
Casselman, B. W.,	Sault Ste. Marie, Ont.	1-10-42
Cavanagh, J. V. A.,	London, Ont.	1-9-39
Cave, H. A.,	Montreal	21-8-42
Chaisson, A. F.,	Saint John, N.B.	7-1-42
Chalmers, R. H.,	Fredericton, N.B.	30-6-42
Charles, W. B.,	Toronto	18-8-41
Chase, L. A.,	Regina, Sask	29-6-42
Chisholm, G. B.,	Rockcliffe, Ont.	7-9-42
Chown, F. R.,	Toronto	1-8-42
Chown, F.		
Christie. F. M.,	Cardston, Alta.	6-1-42
Churchill, L. P.,	Shelburne, N.S.	1-9-41
Clark, E. A.,	Kingston, Ont.	21-7-41
Clark, R. G.,	Toronto	30-6-42
Clarke, F. D.,	Brantford, Ont.	1-4-41
Clarke, W. A.,	New Westminster, B.C.	5-6-42
Clayton, A. B.,	Chesterville, Ont.	15-9-42
Clegg, G. G.,	Picton, Ont.	27-3-42
Clement, G. H.,	Vancouver	20-8-41
Cohen, H.,	Winnipeg	25-7-42
Cole, F. M.,	London, Ont.	11-8-42
Coleman, C. E.,	Calgary, Alta.	9-9-39
Collins, A.,	Fort Erie, Ont.	29-6-42
Colquette, C. B.,	Toronto	28-4-42
Colwell, H. H.,	Nanaimo, B.C.	9-7-41
Comrie, C. L.,	Culross, Man.	15-6-42
Conley, A. E.,	Ottawa	22-6-40
Conn, H. R.,	Toronto	30-6-40
Connolly, C. F.,	Andrew, Alta.	23-6-41
Conroy, J. B.,	Montreal	8-5-40
Cook, N. C.,	Victoria, B.C.	3-4-42
Cooper, G. E.,	Toronto	8-5-42
Cooper, R. H.,	Winnipeg	27-12-39
Corbett, C. A.,	Crystal City, Man.	21-4-42
Cornish, A. L.,	Courtenay, B.C.	16-9-39
Costin, P. A.,	Quebec	25-4-41
Cote, P.-E.,	Quebec	24-3-42
Coulson, E. G.,	Toronto	8-5-42
Coulter, A. R.,	Weyburn, Sask.	15-5-40
Courtenay, H. D.,	Ottawa	1-1-40
Covernton, C. C.,	Vancouver	15-4-41
Coy, F. E.,	Invermere, B.C.	1-2-41
Craft, G.,	Outremont, Que.	
Craig, K. L.,	Vancouver	23-6-41
Cramer, R. W. I.,	Guelph, Ont.	2-3-41
Crane, G. L.,	Radville, Sask.	1-6-42
Creighton, T. M.,	Montreal	14-6-40
Cromar, C. D. L.,	Vermilion, Alta.	14-8-42
Cunningham, W. H.,	St. Catharines, Ont.	15-11-39
Currie, G. C.,	Toronto	1-6-40
Curtis, E. J.,	Vancouver	20-2-42
Dales, C. W.,	Toronto	25-9-40
D'Amours, O.,	Quebec	27-5-42
Dancey, T. E.,	Montreal	1-9-42
Davey, E. L.,	Toronto	19-5-41
Davidson, A. M.,	Winnipeg	18-3-40
Davidson, D. A.,	Cartwright, Man.	15-8-41
Davidson, J. R.,	Vancouver	15-6-42
Davis, H. C.,	San Francisco, Cal.	15-9-42
Dawson, H. S.,	Toronto	21-9-42
Dawson, J. C. C.,	Peterborough, Ont.	12-3-42
Day, C. S.,	Toronto	10-1-40
Day, F. G.,	Edmonton, Alta.	17-10-42
De Beaupre, E. J. J.,	Chauvin, Alta.	4-8-41
Delage, M.,	Quebec	23-5-42
Delahaye, A. L.,	Montreal	5-4-40
Delarue, N. C.,	Toronto	20-7-42
Demers, P. A.,	Montreal	30-12-41
Demers, V. C.,	St. Agapit, Que.	13-8-40
Denison, A. G.,	Windsor, Ont.	12-8-42
Denney, W. L.,	London, Ont.	19-12-40
Derby, A. C.,	Montreal	8-9-42
Derbyshire, W. J. B.,	Fort Erie, Ont.	19-10-42
Devenny, J. P.,	Kitchener, Ont.	29-8-40
Dewitt, C. E. A.,	Wolfville, N.S.	21-6-40
Dickey, M. R.,	Saskatoon, Sask.	15-1-40
Dillane, W. E.,	Toronto	2-10-42
Dinberg, M. C.,	Canton, N.Y.	18-6-41
Dixon, F. O.,	Sudbury, Ont.	20-10-42
Dobson, C. R.,	Edmonton, Alta.	12-2-42
Dobson, E. A.,	Bentley, Alta.	15-11-42
Dolan, R. J.,	South Nelson, N.B.	6-1-41
Dolgoy, M.,	Edmonton, Alta.	1-4-42
Donald, E. F.,	Edmonton, Alta.	3-4-42
Donnell, M. M.,	Saskatoon, Sask.	26-10-42

Name	Address	Date of Appointment
Dorrance, F. S.	Westmount, Que.	1-8-42
Dougall, R. P. I.	Petrolia, Ont.	4-6-41
Downs, W. J.	Calgary, Alta.	16-6-41
Dube, J. A.	Lake Megantic, Que.	15-2-41
Dubeau, J. A. M.	Montreal	13-11-41
Dubinsky, H.	Toronto	11-8-42
Duckworth, D. A.	Toronto	8-9-42
Duffin, J. D.	Toronto	1-5-42
Duffy, J. L.	London, Ont.	4-6-42
Duggan, H. E.	Red Deer, Alta.	25-8-41
Duncan, A. G.	Calgary, Alta.	4-8-42
Duncan, E. H.	Regina, Sask.	20-10-42
Dunlop, W. R.	Calgary, Alta.	25-5-40
Dunn, N. E.	Vermilion, Alta.	12-5-41
Dunton, A. S.	Paris, Ont.	5-3-42
Dure, F. M.	Brighton, Ont.	30-9-40
Dwyer, C. H.	Riverside, Ont.	12-8-42
Dyer, H. F.	Hamilton, Ont.	21-7-41
Earle, P. W.	Mallorytown, Ont.	27-9-40
East, W. H. S.	Winnipeg	23-2-42
Easton, S.	Winnipeg	22-9-42
Edington, A. M.	Montreal	18-2-41
Edmison, E. R.	Toronto	15-6-41
Edwards, J. C. R.	Newmarket, Ont.	10-6-41
Edwards, W. S.	Ottawa	6-9-39
Egan, C. F.	Kingston, Ont.	22-8-41
Elliott, R. R.		
Elliott, T. J.	Larder Lake, Ont.	28-8-42
Ellis, G. H.	Toronto	24-9-42
Epstein, A. A.	New Waterford, N.S.	8-7-40
Evoy, G. H.	Winnipeg	20-5-41
Fahrni, W. H.	Vancouver	15-4-41
Fahrni, G. I.	Winnipeg	1-11-42
Falardeau, I. F.	Winnipeg	10-7-42
Falkner, K. C.	Ottawa	1-9-39
Farrell, W. A.	Toronto	11-8-41
Fassina, R. J.	Port Arthur, Ont.	21-9-42
Feasby, W. R.	Toronto	1-12-39
Ferguson, G. C.	Port Arthur, Ont.	3-10-41
Ferguson, P. D.	Halifax, N.S.	29-6-42
Fielden, E. C.	Toronto	26-12-41
Findlay, C. A.	Lemberg, Sask.	9-8-40
Findlay, D. P.	Toronto	3-11-42
Findlay, J. A.	Winnipeg	1-3-41
Fisher, J. H.	London, Ont.	24-10-42
Fisher, R. E.	Calgary, Alta.	24-10-42
Fitzosborne, D. J.	Vancouver	15-2-42
Fleming, S. A.	Toronto	29-9-42
Flett, R. O.	Winnipeg	2-7-41
Foex, H. E.	Chatham, Ont.	25-7-40
Forbes, G. R.	Kentville, N.S.	12-1-40
Forrest, S. J.	Toronto	20-1-42
Fortier, J.	Quebec	23-3-42
Fowler, J. L. A.	Toronto	1-7-41
Foy, E. F.	Edmonton, Alta.	15-8-42
Fralick, F. T.	Toronto	10-8-42
Francis, G. H.	Vancouver	21-1-42
Fraser, D.	Stratford, Ont.	19-4-41
Fraser, T. A.	Toronto	15-5-42
Fraser, W. R.	Arcola, Sask.	3-9-42
Fremes, I. A.	Montreal	2-7-41
Freundlich, J.	New Westminster, B.C.	20-10-42
Fyshe, T. G.	Montreal	22-5-40
Gadbois, G. E. Y.	Quebec	12-5-42
Gagne, D. S. P.	Quebec	9-6-41
Gagnon, P. P.	Rimouski, Que.	22-7-42
Galloway, J. D.	London, Ont.	1-7-41
Gardner, A. J.	Cornwall, Ont.	17-6-41
Garneau, J. J.	Ottawa, Ont.	17-9-42
Garner, F. O. R	Vancouver	28-9-42
Gaudreault, L.	Quebec	23-5-42
Geddes, J. H.	London, Ont.	21-8-42
Geggie, J. H. S.	Wakefield, Que.	16-9-41
Gessinger, M. E.	Edmonton, Alta.	7-8-42
Gibbons, A. K.	Edmonton, Alta.	17-10-42
Giberson, H. R. G.	Sheet Harbour, N.S.	21-7-42
Gibson, F.	Montreal	1-9-42
Gibson, W. J.	Brockville, Ont.	15-5-42
Giddens, S. W.	Toronto	15-9-42
Gilday, F. W.	Montreal	16-12-40
Gilham, R. E.	Calgary, Alta.	5-10-42
Gilhooly, J. P.	Ottawa	20-12-39
Goddard, E. S.	Toronto	6-4-42
Goldenberg, L. M.	Toronto	29-10-42
Gooderham, M. E. W.	Hamilton, Ont.	28-7-42
Gordon, A. L.	Toronto	1-5-41
Gordon, L.	Montreal	18-9-42
Gordon, M. K.	Leaside, Ont.	4-7-40
Gorman, M. E.	Lindsay, Ont.	2-2-42
Gorssline, R. M.	Halifax, N.S.	
Gosse, C. L.	Cleveland, Ohio	29-6-42
Gottlieb, R.	Outremont, Que.	15-10-42
Graham, E. R.	Luseland, Sask.	15-8-41
Graham, C. R.	Ottawa	1-6-40
Graham, M. D.	Ottawa	25-5-40
Graham, R. W.	Toronto	12-8-42
Graham, W. L.	Whitby, Ont.	6-8-42
Grainger, T. R.	Weston, Ont.	20-5-42
Gray, C. C.	Toronto	11-9-41
Gray, D. W.	Ottawa	1-10-40
Gray, K. C.	Gananoque, Ont.	17-6-40
Gray, N. M.	Montreal	25-9-42
Green, A. C.	Port Arthur, Ont.	17-6-40
Green, C. P.	Brockville, Ont.	1-8-42
Greenblatt, J.	Ottawa	30-6-42
Greenwood, F. C.	St. Catharines, Ont.	21-7-41
Gregory, A. W.	Lambeth, Ont.	2-1-40
Gregory, R. A.	Fairville, N.B.	8-7-40
Gregson, W. E.	Victoria, B.C.	17-12-41
Greig, F. McM.	Toronto	15-10-42
Grenville, I. A.	Toronto	20-7-42
Grieve, J. D.		
Grieve, J. G.	Stratford, Ont.	27-10-42
Griffin, B. M.	Waterford, Ont.	1-10-41
Griffin, J. D. M.	Toronto	26-8-41
Griffith, L. A.	Halifax, N.S.	3-4-41
Groff, H. K.	Edmonton, Alta.	1-6-40
Grondin, G. A.		3-1-41
Grove, J. H.	Paisley, Ont.	27-5-41
Guimont, J. E. C. E.	Pont Rouge, Que.	11-9-39
Gunn, W. R. L.	Fort Frances, Ont.	18-3-40
Gurd, F. N.	Westmount, Que.	16-12-41
Guy, J. A. A. R.	Montreal	27-12-41
Guyatt, B. L.	Birskroaka, Ont.	7-8-41
Hacking, L. C.	Regina, Sask.	8-4-42
Haddad, J. W.	Sudbury, Ont.	15-10-42
Haddad, N. N.	Sudbury, Ont.	30-10-42
Hagerman, A. R.	Toronto	7-1-40
Haig, K. J.	Vancouver	26-9-41
Haight, W. R. W.	Lancaster, Ont.	8-3-41
Hall, N. B.	Campbell River, B.C.	1-7-41
Hall, R. M.	Toronto	7-8-42
Hall, W. M.	Edmonton, Alta.	6-9-39
Hamer, H. E.	Revelstoke, B.C.	15-7-42
Hamilton, H. P.	Kitchener, Ont.	3-4-40
Hamilton, J. D.	Toronto	1-8-40
Hamilton, R. C. M.	Ponoka, Alta.	14-10-41
Hancock, G. R.	Regina, Sask.	15-1-41
Hankin, M.		27-12-41
Hanson, S.	Toronto	1-1-42
Harberson, A. E.	Kingston, Ont.	13-9-39
Harcourt, J. A. A.	Toronto	12-4-41
Hardie, P. W.	Hamilton, Ont.	3-2-41
Hardy, B. C.	Toronto	19-11-41
Hardyment, A. F.	Calgary, Alta.	1-4-42
Harrison, S. R.	Timmins, Ont.	1-5-40
Hart, R. G.	Calgary, Alta.	2-7-40
Harvey, J. M.	Olds, Alta.	1-10-40
Hassard, F. R.	Toronto	8-1-40
Hastings, D. J.	Winnipeg	30-9-42
Hastings, R. C.	Quebec	2-9-39
Hauch, C. Y.	Owen Sound, Ont.	23-9-42
Hauch, P. P.	Preston, Ont.	1-3-41
Haughton, T. J.	Regina, Sask.	8-5-42
Hawke, W. A.	Toronto	16-5-42
Haworth, G. C.	Viking, Alta.	14-7-41
Hay, A. W. S.	Winnipeg	5-3-41
Hazen, J. S.	Toronto	4-6-41
Healy, D. E. L.	Toronto	1-10-42
Heaton, T. G.	Toronto	7-1-40
Hebert, A. J. B.	Lachine, Que.	1-7-40
Hebert, L.	Montreal	8-7-41
Heggie, D. C.	Brampton, Ont.	10-9-39
Heller, E. M.	Toronto	1-9-42
Henderson, E. R.	Montreal	20-9-42
Henry, W. A.	Bentley, Alta.	14-10-41
Herbin, C. A.	Lockport, N.S.	14-11-42
Hermann, J. D.	Toronto	27-5-42
Hetu, J. J. E.	Montreal	28-10-41
Hevey, G.	Montreal	1-11-42
Hewett, C. D.	Peterboro, Ont.	23-5-41
Hewson, R. D.	Olds, Alta.	15-6-40
Hicks, W. H.	Kinistino, Sask.	20-5-41
Hill, L. R.	Toronto	22-9-39
Hill, M. G.	Hamilton, Ont.	
Hillary, N. L.	Aurora, Ont.	15-5-42
Hillis, L. C.	Kingsville, Ont.	7-7-41
Hillsman, J. A. B.	Winnipeg	28-11-40
Himel, H. A.	Toronto	26-10-42
Hitesman, R. J.	Winnipeg	3-6-40
Hobbs, F. S.	Vancouver	15-10-42
Hobbs, G. E.	London, Ont.	22-6-42
Hogg, F. J.	Hamilton, Ont.	27-6-42
Holbrook, R. H.	Toronto	17-9-42
Holden, J. P. N.	Ottawa	27-8-42
Holland, G. A.	Montreal	15-2-42
Hollis, K. E.	Toronto	28-1-42
Hoodless, E. C.	Kamloops, B.C.	15-8-42
Houston, A. B.	Winnipeg	17-4-42
Howard, M. J.	Ottawa	25-5-40
Howden, W. A.	Winnipeg	18-2-41
Howes, J. E.	Toronto	18-5-42
Hudecki, S. M.	Hamilton, Ont.	29-6-42
Hudson, J. E.	Winnipeg	21-4-42
Hughes, R. A.	Saint John, N.B.	1-9-39
Hunt, A. L.	Vancouver	15-9-42
Hunter, J. D.	Victoria, B.C.	12-7-40
Hurtig, A.	Edmonton, Alta.	24-6-40
Hyndman, C. F.	Montreal	1-7-42

Name	Address	Date of Appointment
Ingham, G. H.,	Stratford, Ont.	26-5-41
Ireland, J. R.,	Vancouver	1-11-42
Ironstone, P. S.,	Gogama, Ont.	1-10-42
Irvine, H. J.,	Brigden, Ont.	23-6-41
Jackson, E. J.,	Toronto	15-7-42
Jackson, J. W.,	Toronto	10-8-42
Jacobson, M.,	Halifax, N.S.	15-7-40
Jaimet, C. H.,	Hamilton, Ont.	28-4-41
James, A. A.,	London, Ont.	1-9-39
James, A. B.,	Leaside, Ont.	3-7-40
James, E. S.,	Vancouver	28-9-42
Janes, E. C.,	Hamilton, Ont.	17-2-41
Jauvoish, S.,	St. Vital, Man.	9-7-41
Jenkins, J. S.,	Charlottetown, P.E.I.	29-2-40
Jennings, F. C.,	Saint John, N.B.	2-9-39
Jepson, G. L.,	London, Ont.	10-6-40
Johanson, A. N.,	Lethbridge, Alta.	26-7-40
Johnson, A. McN.,	Vancouver	22-2-42
Johnston, A. C. C.,	Calgary, Alta.	2-9-39
Johnston, R. A. Y.,	London, Ont.	23-8-42
Johnston, W. G.,	Toronto	11-8-42
Johnstone, D. S.,	Regina, Sask.	10-6-40
Jones, W. A.,	Ottawa	26-9-41
Jupp, J. B.,	Woodstock, Ont.	2-10-41
Kahne, H. M.,	Montreal	19-10-42
Kanovsky, S.,	Timmins, Ont.	6-7-42
Kappele, D. P.,	Hamilton, Ont.	22-6-41
Kark, R. M.,	Brookline, Mass.	10-6-42
Kasian, P.,	Transcona, Man.	2-6-42
Kasler, D.,	Toronto	1-5-42
Katz, A. H.,	Ottawa	28-8-42
Kaufman, N.,	Lachine, Que.	17-8-42
Kearns, T. P.,	Bothwell, Ont.	20-5-41
Keevil, R. F.,	Weston, Ont.	1-11-41
Kelly, D. B.,	Toronto	1-6-42
Kelly, G. C.,	Hamilton, Ont.	17-6-42
Kelly, J. J.,	Renfrew, Ont.	14-8-40
Kelly, J. K.,	Zeballos, B.C.	26-5-40
Kelly, J. R.,	Brandon, Man.	4-9-42
Kennedy, A. E.,	Winnipeg	1-6-41
Kennedy, E. T.,	Sussex, N.B.	10-1-42
Kennedy, M. J.,	Sudbury, Ont.	6-7-40
Kenner, H. B.,	Stratford, Ont.	10-7-41
Kenney, A. S.,	Guelph, Ont.	17-11-41
Kenning, S. G.,	Victoria, B.C.	1-2-42
Kenny, R. Y.,	Toronto	12-5-41
Kerster, G. G.,	Kincaid, Sask.	3-6-42
Kerster, J. K.,	Ogema, Sask.	28-5-41
Kickham, L. A.,	Westlock, Alta.	1-1-42
King, P. A. H.,	Victoria, B.C.	16-10-42
Kinsman, J. D.,	South Porcupine, Ont.	23-6-41
Kinsman, J. L.,	Galt, Ont.	16-3-42
Kirouac, C. A.,	Quebec	1-1-40
Kitchen, G. H.,	Toronto	6-9-42
Klass, A. A.,	Winnipeg	25-6-40
Kline, H. J.,	Toronto	8-8-42
Kobrinsky, M. T.,	Winnipeg	24-6-40
Kobrinsky, S.,	Winnipeg	22-6-42
Koyl, L. F.,	Toronto	23-9-40
Kyles, N. B.,	Orangeville, Ont.	14-7-42
Lacasse, L. L.,	Ste. Marie Beauce, Quebec	1-3-41
Lackner, H. A.,	Kitchener, Ont.	16-7-40
Lane, G. A.,	Sault Ste. Marie, Ont.	9-5-42
Langis, G.,	Rimouski, Que.	24-8-42
Langley, G. E.,	Vancouver	24-8-42
La Porte, L. P.,	Joliette, Que.	13-11-41
Large, G. C.,	Vancouver	1-9-39
Lariviere, J. L. P.,	Montreal	21-9-42
Lasalle, C. B.,	Toronto	23-9-42
Lasalle, M. J.-M.,	Toronto	23-9-42
Laski, B.,	Toronto	31-8-42
Latimer, J. W.,	Seeley's Bay, Ont.	24-8-42
Laurin, B.,	Quebec	1-9-39
Lavallee, E.,	Quebec	23-7-41
Lavalle, E. L.,	Neuville, Que.	1-12-40
Lawson, F. S.,	Woodstock, Ont.	14-8-41
Latton, B. D. B.,	Toronto	4-8-42
Learoyd, D. R.,	Vancouver	15-2-40
Leavens, C. C. H.,	Picton, Ont.	2-9-39
Leblond, S.,	Quebec	1-7-40
Lederman, J.,	Toronto	3-3-42
Lee, J. G.,	Toronto	3-4-41
Leef, C. D. S.,	Toronto	1-9-39
Lees, F. W.,	Vancouver	15-4-40
Lefebvre, J. F. A.,	Montreal	12-5-42
Leggett, W. G.,	Toronto	18-7-41
Lemieux, R.,	Quebec	20-8-41
Lerner, M.,	Winnipeg	11-7-42
Leroux, J. A.,	Vancouver	1-10-42
Leslie, W.,	Winnipeg	1-9-42
Levinne, N. N.,	Toronto	11-7-42
Lewis, H. W.,	Battleford, Sask.	16-7-41
Lewison, E.,	Vancouver	3-9-42
Lightman, S. S.,	Toronto	14-5-42
Lindsay, R. D.,	Halifax, N.S.	27-5-40
Lind, J. R.,	Toronto	14-10-42
Littner, N.,	Toronto	8-10-42
Loadman, B. E.,	Winnipeg	21-4-42
Locke, E. E.,	Montreal	2-10-41
Lochead, J. R.,	Montreal	1-5-40
Lough, H. O.,	Kincardine, Ont.	20-2-42
Love, J. W.,	Calgary, Alta.	26-10-42
Lucas, O. C.,	Victoria, B.C.	14-1-42
Luginsky, S. M.,	Winnipeg	29-9-42
Lundon, A. E.,	Montreal	1-9-39
Lynch, E. L.,	Matapedia, Que.	
Lyons, G. A.,	Moncton, N.B.	2-9-39
Lyons, R.,	Winnipeg	10-2-41
MacArthur, F. C.,	Halifax, N.S.	3-6-42
MacDermot, P. N.,	Montreal	27-9-41
MacDonald, C. A.,	Sydney, N.S.	9-9-39
MacDonald, C. J.,	Halifax, N.S.	1-7-40
MacDonald, J. A.,	Hastings, Ont.	12-2-41
MacDonnell, P. M.,	Kingston, Ont.	11-10-39
MacFarlane, J. C.,	Kingston, Ont.	8-9-39
MacKenzie, A. E.,	Toronto	18-8-41
MacKenzie, S. G.,	Truro, N.S.	21-9-42
MacKenzie, W. F.,	Toronto	1-5-42
MacKinnon, A. G.,	Spalding, Sask.	27-3-41
MacKinnon, J. M.,	Victoria, B.C.	19-1-42
MacKinnon, N. D.,	Vancouver	7-8-42
MacLean, C. G. G.,	Vancouver	16-5-41
MacLeod, J. G.,	Finch, Ont.	24-8-42
MacLochlin, E. G.,	Hamilton, Ont.	22-9-42
MacNeill, A. L. H.,	Shaunavon, Sask.	1-12-41
MacNeill, R. D.,	Kensington, P.E.I.	2-9-39
MacPhee, J. A.,	Summerside, P.E.I.	21-7-42
MacPherson, A. W.,	St. Thomas, Ont.	16-12-40
MacRae, A. L.,	Sawyerville, Que.	8-9-41
Magee, R. K.,	Peterboro, Ont.	26-10-42
Magill, A. L.,	Owen Sound, Ont.	19-10-42
Malcolm, F. F. P.,	Dartmouth, N.S.	18-12-39
Malcolm, G. G.,	Ottawa	10-6-40
Malo, R. F.,	Field, Ont.	15-9-42
Maloney, G. C.,	Toronto	19-8-42
Manly, C. C.,	Sandy Lake, Man.	4-9-40
Manning, H. E.,	Orono, Ont.	15-2-40
Manson, A. B.,	Vancouver	1-10-42
Margolus, B.,	Toronto	1-5-42
Margulius, J.,	New Westminster, B.C.	1-9-42
Markham, J. D.,	Fort William, Ont.	21-3-41
Markkanen, V. W.,	Sudbury, Ont.	21-9-42
Marshall, J. E.,	Regina, Sask.	14-7-42
Marshall, W. P.,	Colborne, Ont.	16-9-40
Martel, L.,	Bonaventure, Que.	2-7-42
Marwood, L. R.,	Toronto	9-10-42
Matas, M.,	Berwyn, Alta.	25-6-41
Mathiew, J. E.,	Montreal	28-6-40
Mavety, A. F.,	Toronto	6-3-41
McBroom, J. G.,	Brockville, Ont.	11-6-42
McCabe, J.,	Windsor, Ont.	4-7-42
McCaffrey, F.,	Quebec	25-4-41
McCaffrey, J. A.,	Vancouver	25-2-42
McCaffrey, R. P.,	Vancouver	18-11-40
McConnachie, T.,	Toronto	1-11-41
McCue, J. A. M.,	Smiths Falls, Ont.	1-4-42
McCullough, A. W.,	Winnipeg	18-2-42
McCurdy, D. G.,	Sydney, N.S.	7-6-41
McCutcheon, W. M.,	Toronto	31-5-41
McDiarmid, J. M.,	New Westminster, B.C.	18-4-41
McDonald, W. O.,	Saint John, N.B.	17-2-41
McDougal, A. J.,	Abernethy, Sask.	16-2-41
McDougall, J. W.,	Brockville, Ont.	1-5-42
McEachern, D. S.,	Montreal	29-8-42
McEachern, K. D.,	Toronto	15-9-42
McEvoy, S. J.,	Ottawa	19-10-42
McFadyen, O. J.,	Fairview, Alta.	25-6-41
McFetridge, S. A.,	Vancouver	6-7-42
McFetridge, W. J. M.,	Winnipeg	25-2-40
McGibbon, R. H.,	Outremont, Que.	8-11-39
McGowan, T. P.,	Trochu, Alta.	24-11-41
McGuire, M. G.,	Brockville, Ont.	11-9-42
McInerney, J. P.,	Saint John, N.B.	2-9-39
McIntosh, K. McD.,	Simcoe, Ont.	18-5-42
McIntyre, D. H.,	Edmonton, Alta.	15-8-42
McKay, C. O.,	Saint John, N.B.	15-3-41
McKay, H. F.,	New Glasgow, N.S.	1-9-39
McKay, W. W.,	Ottawa	2-9-39
McKellar, J. C.,	Toronto	12-8-41
McKenty, J.,	Tuxedo, Man.	10-2-42
McKenzie, H.,	Nanton, Alta.	16-9-40
McKenzie, H. F.,	Estevan, Sask.	8-10-42
McKerracher, D. G.,	Brockville, Ont.	23-9-41

Name	Address	Date of Appointment
McKie, J. G.,	Nanton, Alta.	10-11-41
McKinnon, N.,	Downsview, Ont.	10-1-40
McKim, L. H.,	Montreal	1-2-42
McLachlin, A. D.,	London, Ont.	10-8-42
McLean, F. J.,	Winnipeg	17-5-41
McLean, W. T.,	Toronto	14-4-41
McLellan, N. W.,	Montreal	26-9-41
McLeod, J. G.,	Toronto	19-6-41
McLeod, P. A.,	Kingston, Ont.	13-2-42
McLeod, T. R.,	Muncey, Ont.	6-7-41
McManus, J. P.,	Garden Island, Ont.	10-9-40
McNab, J. A.,	Vancouver	7-9-42
McNichol, J. F.,	Galt, Ont.	30-6-42
McPherson, A. R.,	Fort San, Sask.	7-11-41
McPherson, C. J.,	Ottawa	30-7-41
McTavish, G. B.,	Winnipeg	26-10-40
Meakins, J. C.,	Montreal	15-9-42
Medovy, H.,	Winnipeg	27-3-42
Melanson, E.,	Quebec	21-5-42
Melanson, H. P.,	Moncton, N.S.	22-7-40
Mellor, M. D.,	Westmount, Que.	7-9-42
Menzies, F. H.,	Leaside, Ont.	3-11-42
Mercier, J. P. A. J.,	Quebec	2-9-39
Merkeley, N. P.,	Winnipeg	18-2-42
Mesbur, B. J.,	Regina, Sask.	1-10-42
Metcalfe, E. V.,	St. Thomas, Ont.	4-6-42
Metcalfe, H. G.,	Timmins, Ont.	30-9-42
Meth, B.,	Ioco, B.C.	3-8-42
M'Gonigle, R. H.,	St. Andrews, N.B.	15-5-41
Michalyshyn, B.,	Edmonton, Alta.	17-10-42
Mickleborough, K. M.,	Ottawa	8-5-42
Middlebro, A. S.,	Fort William, Ont.	14-11-39
Middlebro, J. G.,	Toronto	14-9-42
Middlebro, J. P.,	Owen Sound, Ont.	4-11-41
Millen, D. B.,	Windsor, Ont.	3-11-42
Miller, A.,	Timmins, Ont.	31-7-42
Miller, D.,	Vancouver	27-6-42
Miller, M.,	Timmins, Ont.	13-10-42
Miller, T.,	Victoria, B.C.	16-9-39
Miller, S. J. C.,	London, Ont.	21-9-42
Miller, R. L.,	Victoria, B.C.	16-9-39
Milligan, W. A.,	Cornwall, Ont.	4-3-41
Millions, J. V.,	Westlock, Alta.	4-11-39
Milne, K. W.,	Gravenhurst, Ont.	4-5-42
Minguy, C. E.,	Quebec	1-9-39
Mitchell, M. D.,	Maple Creek, Sask.	11-6-40
Miron, D.,	Outremont, Que.	27-2-40
Moffatt, D. W.,	Vancouver	1-9-42
Moffatt, W.,	Toronto	25-9-40
Moir, H. K.,	Toronto	7-7-41
Moir, J. H.,	St. Vital, Man.	1-9-42
Monks, H. T. J.,	Montreal	1-12-42
Montemurro, G. A.,	Streetsville, Ont.	26-2-40
Montgomery, G. H.,	Omemee, Ont.	12-2-41
Moore, J. H.,	Kincaid, Sask.	17-3-41
Morehouse, O. E.,	Upper Keswick, N.B.	22-10-42
Morgan, J. R. E.,	Toronto	19-11-40
Morgan, W. C.,	Belleville, Ont.	19-5-41
Moring, P. G.,	Quebec	20-4-42
Morris, D. B.,	Windsor, N.S.	7-7-41
Morris, G. D.,	Owen Sound, Ont.	12-6-40
Moscovich, B. B.,	Vancouver	1-9-41
Moscovich, J. C.,	Vancouver	1-8-42
Moss, J. K.,	Hamilton, Ont.	15-8-41
Mosser, H. A.,	Olderton, Ont.	9-1-42
Mullins, J. F.,	Wallaceburg, Ont.	11-8-42
Mulvihill, L. J.,	Shaunavon, Sask.	29-10-42
Murphy, A. B.,	Smiths Falls, Ont.	1-4-42
Murphy, G. H.,	Halifax, N.S.	15-1-41
Murphy, H. A. L.,	Toronto	15-9-42
Murphy, H. R.,	Fort William, Ont.	15-8-41
Murphy, W. J.,	Saint John, N.B.	13-2-40
Murray, D. R.,	Toronto	20-8-41
Murray, F. S.,	North Battleford, Sask.	29-6-42
Murray, R. B.,	Kingston, Ont.	2-4-40
Murray, W. B.,	Morley, Alta.	15-2-40
Musgrove, J. E.,	Winnipeg	19-9-42
Musgrove, W. M.,	Winnipeg	25-6-40
Mustard, H. R.,	Vancouver	1-9-39
Mustard, R. A.,	Toronto	1-7-41
Mustard, W. T.,	Toronto	6-10-41
Mutrie, E. T.,	Elora, Ont.	4-9-39
Myers, F. C.,	Fonthill, Ont.	1-10-42
Neelands, R. J.,	Kirkland Lake, Ont.	18-5-42
Neilson, C. P.,	Winnipeg	13-8-40
Nelson, F. H.,	Stratford, Ont.	4-6-41
Neville, J. D.,	Camrose, Alta.	1-8-41
Newell, C.,	Toronto	29-6-40
Newman, W. R.,	Toronto	1-9-42
Nichol, A. F.,	Saltcoats, Sask.	21-7-42
Nix, H. L.,	Red Deer, Alta.	15-5-42
Nix, N. W.,	Edmonton, Alta.	7-5-42
Noble, A. B.,	Brampton, Ont.	
Nodwell, R. J.,	Victoria, B.C.	1-9-39
Nolin, G.-H. Val	Brillant, Matapedia, Que.	1-11-41
Noonan, W. T.,	Toronto	17-2-41
Norman, H. R. C.,	Toronto	20-2-41
Norry, H. T.,	Royal Victoria Military Hospital	23-8-42
O'Callaghan, R. H. L.,	Ganges, B.C.	12-1-42
O'Connor, M. J.,	Kingston, Ont.	8-10-42
Ogulnik, V. F.,	Westmount, Que.	7-9-39
O'Neill, W. F. H.,	Winnipeg	15-8-41
Ostry, E. I.,	Toronto	18-5-42
Ostry, H.,	Kamloops, B.C.	15-8-42
Ortved, W. E.,	Walkerville, Ont.	19-8-42
Paddison, D. J.,	British Officer on exchange	
Page, N. A.,	Toronto	1-10-42
Palmer, H. I.,	Brantford, Ont.	17-4-41
Palmer, M. L.,	Battleford, Sask.	2-10-41
Palmer, W. M. R.,	Regina, Sask.	7-7-41
Paradis, P.,	Quebec	30-7-41
Parks, A. E.,	Toronto	2-11-42
Parsons, W. B.,	Red Deer, Alta.	16-11-42
Paterson, J. C.,	Ottawa	10-9-40
Patterson, J. A.,	Newmarket, Ont.	6-5-42
Patterson, W. J.,	Montreal West	15-12-40
Patton, J. O.,	Ottawa	15-7-42
Paulhus, A. A.,	Ste. Clothilde de Horton, Que.	1-4-42
Pearce, J. P.,	Parry Sound, Ont.	2-7-42
Pearson, C. L.,	Red Deer, Alta.	1-10-42
Peart, A. F. W.,	Westboro, Ont.	8-12-40
Pedley, W. H.,	Stirling, Ont.	7-2-40
Pelletier, J. O. A.,	Joliette, Que.	15-11-42
Pendrigh, R. M.,	West Saint John, N.B.	2-9-39
Pennal, G. F.,	Mimico, Ont.	8-11-40
Penny, S. F.,	Toronto, Ont.	15-5-42
Percival, J. A.,	Toronto	15-8-42
Perrett, T. S.,	Welland, Ont.	1-3-40
Perrin, M. B.,	Winnipeg	23-2-42
Perron, S.,	Montreal	12-8-40
Peterson, E. R.,	Saskatoon, Sask.	6-7-42
Petitclerc, J. L.,	Quebec	1-9-39
Phair, W. B.,	Toronto	13-8-41
Pierce, M. M.,	Kamsack, Sask.	5-8-42
Pinkerton, E. K.,	Vancouver	15-10-42
Place, R. E. G.,	Montreal	9-9-41
Plamondon, C. A.,	Quebec	1-6-42
Plewes, D. F.,	Brantford, Ont.	1-10-41
Plewes, F. B.,	Toronto	6-4-42
Poirier, L. J.,	Sudbury, Ont.	29-10-42
Poisson, P.,	Tecumseh, Ont.	28-11-40
Polson, S. MacD.,	Kingston, Ont.	3-2-40
Poole, F. D.,	St. Thomas, Ont.	20-2-42
Portnuff, J. C.,	Winnipeg	23-9-42
Powell, A. B. C.,	Toronto	1-7-42
Poyntz, L. K.,	Toronto	14-7-41
Pratt, W. C.,	Listowel, Ont.	1-7-42
Prince, J. S.,	New York, N.Y.	28-3-42
Procunier, C. W.,	Toronto	7-9-40
Procunier, F. A.,	Lucknow, Ont.	17-8-40
Pugh, D. S.,	Kingston, Ont.	2-11-42
Rabson, L. R.,	Winnipeg	10-10-40
Rae, M. V.,	Calgary, Alta.	18-9-42
Ramey, F. F.,	Fredericton, N.B.	23-10-39
Rankin, A. C.,	Ottawa	10-11-39
Rathbone, E. D.,	Fort William Ont.	9-9-39
Rawson, N. R.,	Winnipeg	24-7-41
Raxlen, S.,	Toronto	1-9-42
Raynor, E. F.,	West Vancouver	2-7-41
Reed, W. A.,	Montreal	14-5-42
Reeds, W. R.,	Agincourt, Ont.	18-4-41
Reid, F. L.,	Trenton, Ont.	1-2-41
Reid, J. A.,	Calgary, Alta.	5-1-40
Reid, R. G.,	Montreal	6-2-41
Reinke, E. E.,	Pembroke, Ont.	1-5-42
Renton, G. W.,	Windsor, Ont.	25-7-41
Revell, D. G.,	Winnipeg	4-10-41
Rice, R. M.,	Victoria, B.C.	16-4-41
Rice, R. G.,	Montreal	10-6-41
Rich, C. B.,	Edmonton, Alta.	20-10-41
Richards, C. A.,	Tillsonburg, Ont.	21-5-42
Richardson, H. J.,	Englehart, Ont.	31-1-42
Richardson, J. F.,	Tilbury, Ont.	23-9-42
Riddell, L. H.,	Winnipeg	22-8-41
Riddolls, W. E.,	Brantford, Ont.	20-2-41
Rider, R. C.,	London, Ont.	23-8-42
Ritchie, J. A.,	Charlottetown, P.E.I.	22-6-42
Robb, I. S.,	Halifax, N.S.	4-9-42
Robert, L. P.,	Montreal	8-9-39
Robertson, B. D.,	Montreal	5-9-39
Robertson, C. M.,	Nelson, B.C.	1-10-42
Robinson, H. E.,	Brampton, Ont.	30-5-42
Robinson, R. B.,	Toronto	17-3-41

Name	Address	Date of Appointment
Robson, G. W.,	Regina, Sask.	4-9-39
Rochette, M.,	La Malbaie, Que.	7-4-42
Rockel, A. C.,	New Dundee, Ont.	11-8-42
Rockman, J. B.,	Toronto	1-9-42
Rogers, J. P.,	Quebec	24-5-41
Rogers, R. M.,	West Hill, Ont.	22-9-42
Rooke, E. D.,	Kingston, Ont.	1-5-42
Rosenfield, V. L.,	Winnipeg	24-8-42
Rosenhek, C.,	Campbellton, N.B.	9-11-42
Ross, A. G.,	Elk Point, Alta.	15-8-40
Ross, C. C.,	London, Ont.	15-4-42
Ross, H. R.,	Sydney, N.B.	1-9-39
Ross, J. R.,	Toronto	13-7-40
Ross, J.,	Toronto	4-12-40
Rossiter, F. P.,	Toronto	12-8-42
Rostrup, O. M.,	Edmonton, Alta.	15-7-41
Rotman, L. R.,	Montreal	18-9-42
Rousseau, J.,	Quebec	6-4-42
Roulston, T. J.,	Regina, Sask.	1-10-41
Rowan, A. A.,	Fredericton, N.B.	1-12-41
Rowland, W. A.,	Leaside, Ont.	30-6-42
Roy, A.,	St. Remi, Que.	25-11-40
Roy, J. F.,	Quebec	9-9-42
Roy, A.,	St. Michel De Squatec, Que.	17-3-41
Roy, P. M.,	St. Pascal, Que.	9-7-42
Roy, P.,	Quebec	22-1-40
Roy, T. E.,	Montreal	10-11-41
Rubin, M.,	Foam Lake, Sask.	19-5-41
Rudd, E. J. K.,	Toronto	10-7-41
Rusen, S. D.,	Winnipeg	23-5-42
Russell, T. F.,	Toronto	31-10-41
Ruston, F. G.,	North Hamilton, Ont.	4-8-42
Rutenberg, L. I.,	Montreal	27-2-40
Rutherford, W. B.,	Sarnia, Ont.	14-9-42
Rutherford, W. G.,	Winnipeg	18-12-41
Ryan, G. H.,	Winnipeg	8-1-40
Samis, J. C.,	Toronto	1-10-41
Sanderson, C. G.,	Toronto	23-9-41
Saunders, F. E.,	Vancouver	27-10-42
Savage, D. C.,	Guelph, Ont.	31-1-42
Savisky, M. F.,	Prince Albert, Sask.	2-2-42
Schiffer, I.,	Toronto	15-5-42
Schneiderman, C.,	Montreal	1-10-42
Schumm, B. J.,	Waterloo, Ont.	3-9-42
Scott, C. I.,	Orangeville, Ont.	14-10-42
Scott, C. V.,	Orillia, Ont.	1-7-40
Scott, D. E.,	Wiarton, Ont.	7-4-41
Scott, G. Du C.,	Fort William, Ont.	10-8-42
Scott, G. O.,	Ottawa	1-3-41
Scott, H. J.,	Westmount, Que.	9-6-42
Scott, H. J.,	Winnipeg	14-5-41
Scratch, J. R.,	Freemont, Sask.	2-7-42
Seddon, T. T.,	Saskatoon, Sask.	26-8-42
Seguin, G. A.,	Montreal	18-4-41
Semenchuk, P. W.,	Fernie, B.C.	10-9-42
Sestrap, L.,	Weyburn, Sask.	25-7-42
Shane, A. G.,	Yarmouth, N.S.	1-11-42
Shapley, J. M.,	Toronto	16-9-42
Sharpe, M. D.,	London, Ont.	3-8-42
Shier, C. B.,	Toronto	6-8-41
Shier, J. W.,	Vancouver	15-9-42
Shier, L. V.,	Lindsay, Ont.	22-10-40
Shipley, M.,	Invermay, Sask.	3-2-41
Shirton, G. K.,	Waterford, Ont.	1-6-42
Shklov, N.,	Vancouver	23-6-41
Silberman, M.,	Toronto	1-10-42
Simard, J. P. A.,	Quebec	2-3-42
Simpson, R. N.,	Manitowaning, Ont.	21-9-42
Sinclair, A. B.,	Toronto	20-12-40
Sinclair, J. W.,	Timmins, Ont.	29-7-41
Singleton, A. H.,	Rouleau, Sask.	3-11-41
Skelley, A. J.,	Pembroke, Ont.	2-3-42
Slade, H. C.,	Miller Town, Nfld.	1-5-42
Sloan, N.,	Winnipeg	11-6-42
Sloan, W. L.,	Toronto	25-2-41
Small, W. D.,	Ottawa	23-9-39
Smillie, R. A.,	Niagara Falls, Ont.	3-10-42
Smith, C. G.,	Kirkland Lake, Ont.	15-7-42
Smith, F. H.,	Winnipeg	11-6-40
Smith, H. O.,	Ingersoll, Ont.	11-2-42
Smith, R. L.,	Montreal	25-7-40
Smith, T. C.,	Kingston, Ont.	25-3-41
Snell, A. E.,	Ottawa	1-10-41
Sodero, T. C. C.,	Sydney, N.S.	10-8-42
Solway, A. J. L.,	Toronto	27-6-42
Soper, W. H.,	Charlottetown, P.E.I.	16-12-40
Sormany, A. H.,	Edmundston, N.B.	29-10-40
Soucie, J. E. G.,	Moonbeam, Ont.	23-9-42
Sparling, F. N.,	Winnipeg	5-3-42
Sproule, H. F.,	Mount Dennis, Ont.	25-9-40
Squires, A. H.,	Toronto	6-4-42
St. Amand, G.,	Loretteville, Que.	11-6-41
Stanley, R. A.,	Vancouver	15-10-42
Stein, M. M.,	Toronto	10-8-42
Stephen, C. R.,	Quebec	16-6-42
Stephenson, E.,	Winnipeg	2-2-42
Stevens, B. W.,	Toronto	10-1-40
Stevenson, J.,	Quebec	24-6-40
Stevenson, J. W.,	Kingston, Ont.	1-7-42
Stevenson, W. D.,	Hamilton, Ont.	30-6-42
Stewart, C. A.,	Chatham, Ont.	30-8-42
Stewart, D. W.,	Hamilton, Ont.	26-6-41
Stewart, R. F.,	Blairmore, Alta.	1-8-41
Stirling, J. T.,	Winnipeg	31-12-40
Stockton, W. H. S.,	Vancouver	1-10-42
Stone, E. L.,	Ottawa	22-4-40
Strauchler, J.,	Langenberg, Sask.	11-9-42
Stringer, F. H.,	Vancouver	14-2-40
Stubbings, R. S.,	Toronto	16-10-42
Sugarman, H.,	Saskatoon, Sask.	10-8-42
Susman, B. R.,	Kingston, Ont.	15-9-42
Sutherland, J. L.,	Milton, Ont.	1-9-39
Sutherland, H. F.,	Glace Bay, N.S.	1-2-40
Sutherland, R. H.,	Picton, N.S.	8-8-40
Sutherland, W. H.,	Agassiz, B.C.	20-10-42
Swanton, A. L.,	Moose Jaw, Sask.	1-6-40
Swartz, D.,	Winnipeg	8-6-42
Taube, H. N.,	Toronto	14-9-42
Taylor, A. H.,	Goderich, Ont.	10-6-41
Taylor, C. H.,	Winnipeg	12-2-42
Taylor, H. E. H.,	Halifax, N.S.	4-6-42
Taylor, H. L.,	Toronto	11-5-42
Taylor, R. B.,	Montreal	17-1-40
Taylor, W. B.,	Wynyard, Sask.	10-4-42
Tchaperoff, I. C. C.,	Vancouver	10-7-42
Telfer, G. W.,	Kingston, Ont.	2-10-40
Temes, S.,	Kirkland Lake, Ont.	8-7-42
Temple, A. D.,	Montreal	25-7-40
Tennant, P. S.,	Kamloops, B.C.	16-11-39
Terry, K.,	Nelson, B.C.	7-8-41
Therien, R. J. B.,	Montreal	10-11-41
Therrien, E. E.,	Vancouver	28-9-42
Thibault, J.,	St. Camille, Que.	11-9-41
Thibault, M. A. G.,	Sherbrooke, Que.	20-5-41
Thivierge, M.,	Levis, Que.	14-4-42
Thompson, C. A.,	London, Ont.	23-8-42
Thompson, F. G.,	London, Ont.	14-9-39
Thompson, R. D.,	Victoria, B.C.	1-6-42
Thoms, A. E.,	Madoc, Ont.	29-7-40
Tindall, J. B.,	Waterloo, Ont.	21-7-42
Tisdale, R. W.,	Delhi, Ont.	12-1-42
Toone, W. M.,	West Vancouver	24-11-41
Tough, F. W. K.,	Toronto	19-3-41
Towers, T. L.,	London, Ont.	2-1-40
Trask, C. R.,	Halifax, N.S.	5-9-39
Tremblay, A.,	Village Montmorency, Que.	1-5-42
Tremblay, P.,	St. Johns, Que.	1-9-39
Truax, A. J.,	Toronto	5-5-40
Trueman, G. E.,	Vancouver	1-6-41
Tucker, F. R.,	Winnipeg	15-7-40
Tucker, J. B.,	Star City, Sask.	11-4-41
Turmel, H.,	Levis, Que.	22-9-41
Turmel, J. T.,	Beaupré, Que.	27-6-42
Turnbull, A.,	Victoria, B.C.	19-5-40
Turnbull, A. R.,	Barrie, Ont.	10-8-42
Turner, W. P.,	Chatham, Ont.	29-11-40
Tutt, W. R.,	Kingston, Ont.	10-11-41
Tuttle, M. J.		18-9-42
Tyrer, E. R.,	Barrie, Ont.	21-7-41
Valeriote, S. L.,	London, Ont.	15-9-39
Vallee, J. L. J. St-A. R.,	Quebec	10-5-41
Vanluven, O.,	Consecon, Ont.	19-7-40
Van Vliet, W. B.,	Toronto	25-7-40
Venini, P. G.,	Vancouver	20-10-42
Verdicchio, A.,	Montreal	23-9-42
Wachs, H. M.,	Montreal	19-10-42
Wagman, B. B.,	Toronto	15-9-42
Walker, C. E.,	Wainfleet, Ont.	21-9-42
Walker, J. E.,	Vancouver	12-5-41
Walker, J. A. L.		24-9-42
Walker, W. R.,	Penticton, B.C.	25-2-41
Wallace, S. A.,	Kamloops, B.C.	1-8-40
Walsh, F. E.,	Springhill, N.S.	1-9-39
Walter, A. B.,	Saint John, N.B.	13-10-39
Wannop, G. G.,	Wetaskiwin, Alta.	1-6-41
Ward, C. V.,	Montreal	1-9-39
Warner, W. P.,	Toronto	1-9-39
Warren, D. A.,	Hamilton	10-1-41
Warren, D. R.,	Fenelon Falls, Ont.	1-5-42
Watson, C. H.,	Toronto	7-1-40
Watson, E. E. B.,	Toronto	15-9-42
Watson, J. H.,	Dartmouth, N.S.	27-7-42
Watts, G. O.,	Toronto	20-8-41
Weaver, M. A.,	Burlington, Ont.	24-6-42
Weber, J. J.,	Woodstock, Ont.	2-7-41
Webster, W. R.,	Hamilton, Ont.	24-8-42
Weekes, W. E.,	Exeter, Ont.	4-6-41
Weinstock, J. W.,	Windsor, Ont.	3-8-42
Weissgerber, L. A.,	Gore Bay, Ont.	26-7-41
Weldon, I. T.,	Barrie, Ont.	10-8-42
Wells, T. J.,	Beebe, Que.	1-10-40

Name	Address	Date of Appointment
Whelpley, E. H.,	Angusville, Man.	7-6-40
White, H. E.		3-9-42
White, Ira Simmonds,	Port Coquitlam, B.C.	25-7-40
White, J.,	Toronto	3-11-42
Whitelock, C. K.,	Niagara Falls, Ont.	4-7-41
Whiteside, W. C.,	Edmonton, Alta.	15-7-41
Whitmore, A. E.,	Vancouver	19-8-41
Whyte, W. D.,	Owen Sound, Ont.	21-9-42
Wightman, K. J. R.,	Toronto	29-6-42
Wigmore, F. H.,	Moose Jaw, Sask.	6-10-42
Wilfong, J. H.,	Hamilton, Ont.	30-10-42
William, C. D. G.,	Toronto	23-4-41
Williams, C. F.,	Ottawa	10-9-40
Williams, D. H.,	Vancouver	23-11-42
Williams, G. S.,	Winnipeg	10-4-40
Williams, J. E.,	St. Mary's, Ont.	30-8-42
Willoughby, J. B.,	Napanee, Ont.	13-11-39
Wilson, G. E. D.,	Ayr, Ont.	28-4-42
Wilson, G. McL.,	Revelstoke, B.C.	20-11-42
Wilson, H. D.,	Princeton, Ont.	1-6-42
Wilson, J. C.,	London, Ont.	2-1-40
Wilson, J. C. S.,	Port Colborne, Ont.	3-11-42
Wilson, N. K.,	Toronto	7-7-40
Wilson, R. C.,	Alliston, Ont.	17-8-42
Wilson, R. J.,	Hamilton, Ont.	14-5-42
Wilson, T. S.,	Saint John, N.B.	14-5-42
Wilson, W. A.,	Vancouver	5-6-42
Winfield, G. A.,	Halifax, N.S.	1-9-39
Winkler, I.,	Outremont, Que.	10-7-42
Winkler, W. N.,	Toronto	22-8-42
Winsor, A. L.,	Norton, N.B.	1-11-41
Wintrob, B.,	Toronto	22-9-42
Wise, D. K.,	Toronto	7-10-42
Witkov, H.,	Montreal	18-9-42
Wollin, D. G.,	Ingersoll, Ont.	7-7-41
Wolochow, P.,	Mayerthorpe, Alta.	2-7-41
Wood, G. W.,	Montreal	1-4-41
Wood, J. H.,	Toronto	11-11-40
Wood, L. G.,	Vancouver	27-7-41
Wood, W. J.,	Winnipeg	11-9-41
Woodland, L. A.,	Toronto	31-8-42
Worobetz, S.,	Lucky Lake, Sask.	3-9-42
Worrell, J. C.,	Halifax, N.S.	12-5-42
Worsley, G. H.,	Winnipeg	1-9-40
Wray-Johnston, K. H.,	Vancouver	6-7-42
Wright, H. P.,	Montreal	1-4-42
Wright, J. G.,	Regina, Sask.	11-4-41
Wright, R. P.,	Montreal	8-5-40
Young, B. H.,	Kingston, Ont.	24-6-41
Young, G. W.,	Toronto	16-5-42
Young, J. C. G.,	Ottawa	21-7-42
Zacks, L.,	Peterborough, Ont.	1-8-41
Zale, C.,	Toronto	30-6-42
Zelding, A. J.,	Toronto	22-7-42
Zeldin, M.,	Toronto	16-10-42
Zender, R. J.,	Edmonton, Alta.	3-8-42
Zinkann, R. W. J.,	Ottawa	16-7-40

SECTION II

Aberhart, C.,	Toronto	1-9-39
Aberhart, W. R.,	Seaforth, Ont.	21-6-40
Achim, R. B.,	Montreal	28-4-41
Adams, G. T.,	Montreal	29-3-41
Ainslie, E. H.,	Toronto	1-9-39
Aitken, G. W. A.,	London, Ont.	14-9-42
Alexander, L. G.,	Calgary, Alta.	1-3-41
Allan, B. M. E.,	Toronto	10-8-40
Allen, H. W.,	Winnipeg	28-5-40
Alleyn, C. H.,	Quebec	21-9-39
Anderson, B. F.,	Toronto	1-6-40
Anderson, E. H.,	Montreal	8-5-40
Anderson, J. L. M.,	Victoria, B.C.	7-8-40
Anderson, J.,	Winnipeg	15-10-41
Andrew, J. E.,	East Royalty, P.E.I.	15-11-39
Ansley, H. A.,	Toronto	5-2-41
Archibald, B. C.,	Glace Bay, N.S.	10-6-40
Argue, F. J.,	Toronto	26-2-40
Armstrong, E. C.,	London, Ont.	31-5-41
Bagnall, A. W.,	Toronto	1-3-41
Baillargeon, J. B. A.,	Montreal	1-7-42
Baird, M. McC.,	Vancouver	1-8-40
Baker, C. E.,	Denzil, Sask.	25-9-39
Baker, J. E.,	Pt. Colborne, Ont.	1-12-41
Baldwin, S. G.,	Vernon, B.C.	26-3-40
Balfour, J.,	Montreal	19-7-40
Balinson, R. H.,	Hamilton, Ont.	13-2-41
Banfill, S. M.,	Cookshire, Que. (prisoner of war)	8-7-40
Barr, J. W. B.,	Lanark, Ont.	14-9-40
Barrie, J. G.,	Winnipeg	4-12-40
Barron, R. D.,	Toronto	10-1-41
Bassett, L. W.,	Victoria, B.C.	1-2-42
Bastedo, G. M.,	London, Ont.	16-9-39
Bates, J. F.,	New Aberdeen, N.S.	31-7-40
Bazin, A. R.,	Montreal	16-6-40
Beardon, W. A.,	Neudorf, Sask.	4-2-41
Belanger, P. B.,	Ottawa	1-7-42
Belkin, A.,	Eastend, Sask.	15-11-40
Bell, J. K.,	Sarnia, Ont.	1-11-39
Bennett, C. F.,	Moose Jaw, Sask.	15-7-40
Bensley, E. H.,	Montreal	15-6-40
Benson, R. A.,	London, Ont.	20-3-40
Bernstein, P.,	Cochrane, Ont.	19-9-40
Bethune, C. M.,	Halifax, N.S.	1-9-39
Bice, W. K.,	London, Ont.	2-9-39
Bie, W. F.,	Vancouver	6-6-41
Bigelow, G. B.,	Victoria, B.C.	5-5-41
Bird, R. L.,	Belleville, Ont.	19-8-40
Bissett, G. W. C.,	Duncan, B.C.	15-5-41
Black, G. M.,	Swansea, Wales	8-6-42
Blaid, R.,	Quebec	17-3-40
Bleeks, C. K.,	Winnipeg	27-12-39
Blier, U.,	Riviére du Loup, Que.	7-3-41
Bonnell, F. H.,	Vancouver	1-9-39
Booth, M. L.,	Wallaceburg, Ont.	5-6-41
Boothroyd, W. E.,	Halifax, N.S.	1-8-40
Botterell, E. H.,	Toronto	4-1-40
Boucher, H. H.,	Vancouver	1-2-42
Boulter, W. L.,	Vancouver	1-9-39
Bourne, F. M.,	Montreal	1-6-40
Bowering, M. W.,	Regina, Sask.	9-9-39
Bowes, G. C.,	Montreal	30-6-41
Bowman, F. B.,	Hamilton, Ont.	2-9-39
Boxer, L.,	Swift Current, Sask.	15-7-40
Boyd, A. R. J.,	Vancouver	16-4-41
Boyd, S. A.,	Winnipeg	2-9-39
Boyd, W. J.,	Ottawa	26-10-39
Boyden, R. W.,	Toronto	8-6-40
Brachman, B.,	Regina, Sask.	15-7-40
Bradshaw, J. A.,	Hamilton, Ont.	26-2-40
Bramley-Moore, W.,	Edmonton, Alta.	11-9-39
Brayley, L. G.,	Port Credit, Ont.	15-9-39
Bridge, J. W.,	Edmonton, Alta.	11-9-39
Broadfoot, T. W. L.,	Fergus, Ont.	21-2-42
Brosseau, B. L. P.,	Montreal	26-6-41
Brown, A. T.,	Montreal	15-7-42
Brown, B. C.,	London, Ont.	1-7-41
Brown, L. W.,	Ottawa	6-9-39
Brown, M. M.,	Winnipeg	17-4-40
Brown, M. H.,	Toronto	2-9-39
Brown, R. E.,	Balcarres, Sask.	10-2-41
Bruce, D. S.,	Regina, Sask.	22-9-39
Bruser, M.,	Edmonton, Alta.	1-1-40
Bucove, B.,	Rockglen, Sask.	3-3-41
Bundoch, J. B.,	Quebec	9-9-39
Burch, J. E.,	Weyburn Sask.	16-9-39
Burke, D. T.,	Ottawa	24-2-40
Burton, G. S.,	Kingston, Ont.	3-2-40
Byers, J. N. C.,	Rimbey, Alta.	7-9-39
Calder, J. R.,	Brantford, Ont.	29-5-40
Caldwell, R. M.,	Yarmouth, N.S.	25-7-40
Cameron, D. G.,	Montreal	2-7-41
Campbell, C. A.,	St. Thomas, Ont.	13-7-40
Campbell, D.,	Charlottetown, P.E.I.	2-9-39
Campbell, D. D.,	Toronto	11-1-40
Campbell, J. M.,	Saskatoon, Sask.	15-7-40
Cannell, D. E.,	Toronto	1-9-39
Card, L. W. B.,	Vancouver	19-2-40
Cardy, J. de V.	Edmonton, Alta.	24-2-42
Carette, L.,	Levis, Que.	17-7-40
Carleton, M.,	Winnipeg	28-6-40
Caswell, C. B.,	Beamsville, Ont.	13-2-41
Caverhill, M. R.,	Victoria, B.C.	6-9-39
Chartier, J.,	Ste. Hyacinthe, Que.	22-7-42
Cherry, A.,	Lethbridge, Alta.	11-2-41
Chisholm, M. J.,	New Waterford, N.S.	1-6-40
Christie, H. E.,	Amherst, N.S.	30-6-41
Christopherson, E.,	Vancouver	23-7-41
Chute, A. L.,	Toronto	13-7-40
Civkin, S. W.,	Winnipeg	16-5-42
Clare, D. W.,	Kingston, Ont.	13-6-40
Clare, W. H.,	Guelph, Ont.	7-6-41
Clark, C. W.,	Winnipeg	27-12-39
Clarke, K. A. C.,	Calgary, Alta.	28-6-40
Clendinnen, I. C.,	Hamilton, Ont.	2-9-39

Name	Address	Date of Appointment
Cloutier, E.	Ansonville, Ont.	13-12-40
Coates, K. J.	Winnipeg	1-9-39
Cock, J. G.	Newmarket, Ont.	1-4-41
Coddington, R. D.	Ocean Fall, B.C.	23-4-40
Coffey, T. H.	East Saint John, N.B.	23-10-39
Cohen, M. S.	Outremont, Que.	2-1-42
Cohen, W.	Montreal	1-6-40
Coke, W. L.	London, Ont.	1-9-39
Coleman, J. U.	Duncan, B.C.	17-4-40
Colman, H.	Prince Albert, Sask.	9-12-40
Conn, R. S.	Regina, Sask.	11-12-39
Conover, K. I.	Montreal	15-11-39
Contway, M. A. A.	Kirkland Lake, Ont.	16-6-41
Copping, G. A.	Westmount, Que.	15-6-40
Corbin, M. F.	Toronto	13-2-42
Corrigan, C. E.	Winnipeg	20-10-39
Couper, W. M.	Montreal	15-6-40
Cowie, A. S.	Wolfville, N.S.	12-6-40
Cragg, B. H.	New Westminster, B.C.	22-6-40
Cram, J. B.	Winnipeg	15-9-41
Cramer, J. B.	Woodville, Ont.	
Crawford, C. S.	The Pas, Man.	25-7-40
Crawford, J. N. B.	Winnipeg	1-9-39
Croll, L. D.	Saskatoon, Sask.	13-9-39
Crosby, C. H.	Montreal	2-7-41
Cross, C. E.	Three Rivers, Que.	7-9-39
Currie, G. A. W.	Picton, Ont.	4-9-39
Curry, B. H. G.	Toronto	12-9-39
Dalrymple, T.	Vancouver	12-1-42
Dalziel, W. R.	Toronto	21-11-40
Dauphinee, J. A.	Toronto	1-4-41
Davidson, I. W.	Parry Sound, Ont.	14-9-40
Davis, H. R. L.	Vancouver	1-9-39
Daymond, R. S.	Viscount, Sask.	21-12-39
De St. Victor, J.	Quebec	21-9-39
Demers, L. P. E.	St. Farnham, Que.	15-2-42
Dewar, F. P.	Toronto	8-6-40
Dickinson, S. G.	Montreal	20-5-40
Dickison, J. C.	Westmount, Que.	30-6-41
Dickson, R. C.	Toronto	1-9-39
Dillane, J. G. R.	Hamilton, Ont.	2-9-39
Dinan, J. J.	Montreal	10-10-40
Dobie, F. C.	Port Arthur, Ont.	30-7-41
Dohan, M. J. T.	Victoria, B.C.	3-8-40
Douglas, R. P.	Clinton, Ont.	1-5-41
Downing, G. M.	Otterville, Ont.	1-7-41
Doyle, A. M.	Kingston, Ont.	10-8-41
Duffy, J. C.	Chatham, N.B.	26-6-40
Dunham, B. T.	Nelson, B.C.	3-2-41
Dunlop, T. C.	Toronto	13-6-41
Dussault, F.	Montreal	2-1-40
Eaglesham, D. C.	Montreal	9-7-41
Eason, M.	Toronto	18-7-42
Eaton, R. B.	Amherst, N.S.	5-9-40
Edis, J. F.	Toronto	1-8-40
Edmison, H. M.	Winnipeg	27-12-39
Ein, H. N.	Montreal	18-9-42
Elder, H. M.	Montreal	1-9-39
Elkington, E. H. W.	Victoria, B.C.	2-1-42
Elliot, H. C. S.	Halifax, N.S.	7-9-39
Elliott, H. W.	Montreal	20-5-40
Elliott, M. R.	Winnipeg	27-5-40
Elvin, N. L.	Winnipeg	27-12-39
England, N. J.	London, Ont.	21-9-40
Eshoo, H.	Winnipeg	27-6-42
Evans, A. M.	Vancouver	5-12-40
Evans, C. C.	Creighton Mine, Ont.	26-7-41
Evans, S. E.	Vancouver	17-10-41
Ewart, H. T.	Hamilton, Ont.	2-9-39
Ewen, W. J.	Port Arthur, Ont.	8-9-39
Fahrni, B. M.	Winnipeg	27-2-41
Fairbairn, L. M.	Estevan, Sask.	15-7-40
Fairfield, G. C.	Winnipeg	2-3-40
Farmer, G. R. D.	Hamilton, Ont.	2-9-39
Feeney, M. W. C.	London, Ont.	10-2-41
Feick, T. B.	New Hamburg, Ont.	16-7-40
Fenwick, C. P.	Toronto	28-12-39
Ferguson, C. G.	Toronto	5-5-42
Ferguson, G. G.	Moose Jaw, Sask.	22-6-40
Ferguson, R.	Montreal	15-6-40
Ferrier, G. C.	Brockville, Ont.	22-9-42
Finklestein, W. E.	Westmount, Que.	1-7-42
Fish, F. H.	Calgary, Alta.	5-9-39
Fish, H. W.	McLennan, Alta.	24-6-41
Flahiff, E. W.	Toronto	12-8-41
Fleming, A. G.	Montreal	25-11-42
Fleming, J. M.	Bala, Ont.	12-1-42
Fletcher, J. P.	Toronto	13-7-40
Fowler, A. C.	Perth, Ont.	16-9-40
Fowler, W.		21-9-40
Fraleigh, S. B.	Petrolia, Ont.	1-11-41
Frank, H. F.	Langstaff, Ont.	1-3-40
Fraser, G. M.	Peterborough, Ont.	15-11-39
Fraser, N. P.	Toronto	1-3-41
Fraser, W. A.	Victoria, B.C.	1-9-39
Freele, L. W. U.	Glencoe, Ont.	3-7-40
Frost, A. C. G.	Vancouver	19-9-39
Frost, J. W.		
Gaboury, P. C.	Outremont, Que.	4-9-39
Galbraith, H. S. B.	Montreal	15-8-40
Gander, T. A.	Peace River, Alta.	17-7-40
Ganshorn, J. A.	Vancouver	1-9-39
Gardner, C. McG.	Montreal	20-5-40
Gardner, J. S.	Edmonton, Alta.	6-12-39
Geddes, A. K.	Montreal	9-7-41
Gemmell, J. P.	Assiniboia, Sask.	11-3-42
Gibson, T. C.	Hamilton, Ont.	2-12-39
Gilchrist, W. S.	Halifax, N.S.	2-8-40
Gill, G.	Quebec	1-9-39
Gillrie, R. B.	Mitchell, Ont.	30-7-40
Gislason, H. E.	Vancouver	16-7-40
Glass, W. E.	Hamilton, Ont.	11-9-39
Gliddon, E. C.	St. Thomas, Ont.	24-6-41
Glover, A. M.	Kingston, Ont.	18-7-40
Goldberg, H. I.	Halifax, N.S.	17-5-42
Gomery, H. H.	Kingston, Ont.	7-4-41
Gordon, C. A. R.	Winnipeg	1-9-39
Gordon, R. A.	Toronto	1-9-39
Gordon, S. D.	Toronto	1-9-39
Gossage, C. D.	Toronto	11-9-39
Gosselin, J.	Quebec	4-6-40
Gough, W. F.	Drummondville, Man.	3-7-40
Gould, C. E. G.	Vancouver	29-3-41
Gow, J. A.	Dundas, Ont.	29-9-41
Grant, D. K.	Winnipeg	20-8-40
Gray, G. C.	Port Rowan, Ont.	19-8-41
Gray, K. G.	Weston, Ont.	5-6-41
Greenberg, C.	Irma, Alta.	19-12-41
Greenwood, W. F.	Toronto	12-3-41
Greer, K. C.	Toronto	8-6-41
Greig, J. W. A.	Bridgewater, N.S.	30-6-41
Griffith, G. S.	Holdfast, Sask.	6-8-41
Grossman, A. A.	Montreal	1-7-42
Gundry, C. H.	Vancouver	10-3-41
Hair, H. C.	Toronto	1-9-39
Halkett, N. McL.	Ottawa	20-11-39
Halpenny, G. W.	Montreal	8-5-40
Hames, C. F. W.	Regina, Sask.	1-9-39
Hamilton, K. A.	Edmonton, Alta.	5-10-39
Hamilton, G. F.	Winnipeg	27-6-40
Hammond, A. S.	Fort Erie North, Ont.	9-10-40
Handford, H. L.	Renfrew, Ont.	4-6-40
Hanna, R. J. E.	Toronto	6-8-41
Hannay, G.	Kitchener, Ont.	22-9-42
Hardy, A. W.	Edmonton, Alta.	12-2-42
Harvie, D. A.	Collingwood, Ont.	31-5-41
Harvie, R. M.	Midland, Ont.	24-6-40
Haszard, J. F.	Kimberly, B.C.	7-9-39
Hayter, F. W.	Alameda, Sask.	19-7-40
Heal, F. C.	Moose Jaw, Sask.	12-11-42
Heathcote, E. T.	Toronto	1-7-40
Hedges, L. S.		
Heller, J. M.	Toronto	15-9-41
Henderson, H. A.	Toronto	1-9-39
Henneberg, C. C.	Flin Flon, Man.	9-9-39
Hershon, H.	Outremont, Que.	21-7-41
Hethrington, H.	Toronto	18-6-40
Hicks, R. A.	Exshaw, Alta.	8-9-39
Hill, J. C.	Toronto	12-5-42
Hill, W. H. P.	Montreal	20-5-40
Hoggarth, W. B.	Ottawa	1-9-39
Holland, L. G.	Halifax, N.S.	10-8-40
Holland, T. E.	Winnipeg	4-9-39
Hollenberg, C.	Winnipeg	18-7-40
Holmes, C. E.	Lamont, Alta.	15-11-39
Holt, L.	Saint John, N.B.	1-1-41
Homans, C. O.	Hubbards, N.S.	6-11-40
Homer, G. F.	Vancouver	10-1-41
Hough, H. B.	Windsor, Ont.	5-9-39
Houston, G. G.	Charlottetown, P.E.I.	1-8-40
Houston, S. W.	Kingston, Ont.	28-3-40
Howard, R. P.	Montreal	20-5-40
Howes, E. W. McL.	Toronto	7-7-41
Huckvale, W. S.	Kimberly, B.C.	17-11-41
Huggard, L. H.	Vancouver	19-9-39
Hume, W. E.	Sherbrooke, Que.	2-9-39
Hunter, H. B. McG.	Reston, Man.	20-7-40
Hunter, K. A.	London, Ont.	1-9-39
Hurteau, J. L. A.	Montreal	7-5-41
Hyland, H. H.	Weston, Ont.	1-9-39
Inglis, W. A. N.	Westmount, Que.	1-4-41
Ireland, J. A.	Kamloops, B.C.	1-9-39
Ireland, P. E.	Toronto	4-9-40
Jackson, B. A.	Bury, Lancs.	2-2-42
Jacobs, A. L.	The Pas, Man.	2-7-41
James, E. A.	Orillia, Ont.	5-1-41
Johnson, C. H.	Summerside, P.E.I.	20-2-40

Name	Address	Date of Appointment
Johnson, L. G.,	Boston, Mass.	1-8-42
Johnston, B. S.,	Montreal	15-6-40
Johnston, D. W. B.,	Montreal	27-5-40
Johnston, F. D.,	Montreal	1-4-41
Johnston, G. C.,	Vancouver	16-6-41
Johnston, H. C.,	Ottawa	1-9-39
Johnston, W. S.,	London, Ont.	19-12-40
Jolicoeur, A. J. D.,	Montreal	20-5-42
Jones, C. MacL.,	Halifax, N.S.	1-8-40
Jose, J. G.,	St. Mary's, Ont.	24-9-39
Kambourian, G. S.,	Montreal	8-10-41
Keddy, G. W. A.,	Saint John, N.B.	13-8-40
Keene, J. D.,	Maxenod, Sask.	23-4-41
Kennedy, E. G.,	Belleville, Ont.	13-6-40
Kenning, G. C.,	Victoria, B.C.	6-9-39
Keith, W. S.,	Toronto	25-5-42
Kergin, F. G.,	Toronto	1-12-39
Kerr, R. B.,	Toronto	2-7-40
Kilgour, J. McC.,	Montreal	15-6-40
Kilpatrick, C. D.,	Blyth, Ont.	3-6-40
Kingstone, H.,	Toronto	30-5-42
Kirk, C. J.,	Saskatoon, Sask.	15-7-40
Kirkpatrick, G. M.,	Vancouver	1-10-40
Kirsch, A.,	Westmount, Que.	24-2-42
Kobrinsky, S.,	Mazenod, Sask.	11-6-40
Korman, M.,	Toronto	11-8-42
Kraft, K. A.,	Hamilton, Ont.	9-9-42
Kussner, J.,	Kirkland Lake, Ont.	2-11-40
Labreque, M. J. P.,	Montreal	1-7-42
Lamoureux, C. E.,	Montreal	1-7-42
Laird, R. R.,	Vancouver (prisoner of war)	21-3-40
Landry, R. D.,	Buctouche, N.B.	9-9-40
Langille, J. A.,	Pugwash, N.S.	16-3-40
Lansdown, L. P.,	Winnipeg	28-12-39
Laplante, J. P. A.,	Granby, Que.	20-5-40
Larue, A.,	Levis, Que.	11-8-40
Latour, G.,	Quebec	8-4-40
Lazareck, I. L.,	Winnipeg	26-3-42
Lea, R. G.,	Sudbury, Ont.	14-12-40
Leech, B. C.,	Regina, Sask.	1-9-39
Leddy, J. E.,	Toronto	1-7-41
Leech, G. V.,	Lethbridge, Alta.	15-6-41
Leeson, L. H.,	Vancouver	14-9-40
Leishman, J. D.,	Winnipeg	28-5-40
Lerner, A.,	Carstairs, Alta.	14-9-39
Letourneau, C. U.,	Montreal	13-10-39
Lewin, G. W.,	Stamford Centre, Ont.	23-7-40
Lewis, R. R.,	Montreal	1-5-42
Lindley, L. C.,	Saint John, N.B.	30-7-40
Lindsay, J. G. K.,	Saskatoon, Sask.	15-7-40
Linton, J. A.,	Toronto	1-9-39
Little, W. R.,	Toronto	4-4-41
Loftus, L. J.,	London, Ont.	13-6-40
Logan, H. L.,	Salisbury, N.B.	30-5-40
Long, G. S.,	Edmonton, Alta.	25-3-40
Long, R. C.,	Montreal	2-7-41
Loree, L. A.,	Guelph, Ont.	4-9-39
Lowrey, S. R.,	Toronto	4-11-41
Luckey, L. E. R.,	Toronto	1-9-39
Luke, J. C.,	Montreal	10-3-41
Lunam, J. B.,	Montreal	7-6-41
Luton, R. M.,	St. Thomas, Ont.	1-9-39
MacDonald, D. G. H.,	Toronto	13-5-40
MacDonald, J. B.,	Montreal	9-4-41
MacDonald, R. I.,	Toronto	2-7-40
MacDonald, W. K.,	Ottawa	11-12-40
MacDougall, J. T.,	Indian Head, Sask.	16-5-40
Macewen, H. B.,	Boston, Mass.	30-7-41
Mace, W. E.,	London, Ont.	27-5-41
MacFarland, M. T.,	Cold Lake, Alta.	27-12-40
MacFarlane, J. A.,	Toronto	14-8-41
MacIsaac, W.,	Glace Bay, N.S.	12-6-40
MacKay, A. M.,	New Glasgow, N.S.	12-4-40
MacKay, A. F.,	Oshawa, Ont.	18-5-40
MacKeen, R. A. H.,	Rothesay, N.B.	17-3-41
MacKenzie, D. W.,	Montreal	24-7-40
MacKenzie, F. D.,	Montreal	2-7-41
MacKenzie, K. R.,	Montreal	16-9-39
MacKinnon, C. G.,	Bridgewater, N.S.	20-7-40
MacKinnon, W. B.,	Winnipeg	3-7-40
MacLaren, R. D.,	Whitby, Ont.	8-6-40
MacLean, D. L.,	Toronto	4-9-39
MacLean, H. M.,	Moncton, N.B.	22-7-40
MacLean, I. S.,	Winnipeg	8-6-40
MacLean, T. K.,	Vancouver	17-6-41
MacLennan, J. A.,	Windsor, Ont.	1-9-40
MacLeod, B. A.,	Fort William, Ont.	5-9-39
MacLeod, D. R. E.,	Toronto	1-9-39
MacMillan, J. A.,	Vancouver	1-3-40
MacNaughton, E. A.,	Hampstead, Que.	15-6-40
MacNeill, C. H.,	Campbellford, Ont.	1-9-40
MacPherson, A. D.,	Ponoka, Alta.	11-9-39
MacPherson, G. B.,	Guelph, Ont.	14-9-39
MacPherson, M. M.,	Vancouver	1-7-41
Mader, V. O.,	Halifax, N.S.	1-9-39
Magladery, J. W.,	Toronto	2-1-42
Magner, D. E.,	Toronto	1-9-39
Major, C. S.,	Halifax, N.S.	1-9-39
Malcolmson, P. H.,	Edmonton, Alta.	4-2-42
Maley, S. C.,	St. Boniface, Man.	1-12-39
Malkin, S.,	Winnipeg	5-3-42
Malone, G. M.,	Regina, Sask.	15-7-40
Maloney, P. J.,	Ottawa	5-9-39
Malouf, G. M.,	Morristown, N.Y.	1-5-41
Mandel, J. B.,	Saskatoon, Sask.	8-2-41
Marantz, H.,	Winnipeg	28-7-41
Martin, F.,	Chatham, N.B.	11-12-40
Martin, R. B.,	Regina, Sask.	15-7-40
Martin, S. J.,	Montreal	20-5-40
Mathews, W. H.,	Montreal	20-5-40
McCannel, J. S.,	Victoria, B.C.	6-9-39
McCarroll, J. G.,	Port Arthur, Ont.	8-9-39
McCart, H. W. D.,	Toronto	1-9-39
McCormack, C. W.,	Renfrew, Ont.	10-10-40
McCrimmon, D. R.,	Montreal	9-12-39
McCullough, D. W.,	Toronto	13-7-40
McCusker, E. A.,	Regina, Sask.	17-10-39
McCutcheon, C. W. V.,	Toronto	27-5-40
McCutcheon, J. E.,	Regina, Sask.	15-7-40
McDonald, A. D.,	New Waterford, N.S.	18-6-40
McFadzean, W. T.,	Brantford, Ont.	27-6-41
McFetridge, J. G.,	Winnipeg	12-12-40
McGarry, G. C.,	Niagara Falls, Ont.	2-9-39
McGarry, J. M.,	Niagara Falls, Ont.	15-11-39
McGill, W. L. C.,	Toronto	1-7-41
McGillivray, N. B.,	Toronto	1-9-39
McGovern, J. E.,	Montreal	20-5-40
McIntosh, C. A.,	Montreal	15-6-40
McIntosh, J. D.,	Fort William, Ont.	5-9-39
McKenna, L. B.,	London, Ont.	28-5-40
McKenty, V. J.,	West Kildonan, Man.	1-5-41
McKercher, A. E.,	London, Ont.	1-3-40
McKibbon, W. A.,	Wingham, Ont.	16-7-40
McLaughlin, J. A.,	Saint John, N.B.	2-9-39
McLean, G. H.,	Guelph, Ont.	4-9-39
McLeod, J. G.,	Regina, Sask.	1-7-40
McManus, J. F. A.,	Garden Island, Ont.	27-9-40
McMurtry, T. S. G.,	Vancouver	6-6-41
McNeel, B. H.,	Toronto	5-6-41
McNicol, H. L.,	Flin Flon, Man.	3-1-40
McQuade, G. D.,	Montreal	7-7-41
McRae, C. A.,	T.O.S. Overseas	28-1-42
Medine, S. M.,	Montreal	4-9-41
Megill, A. H.,	Ottawa	1-6-41
Meiklejohn, R. B.,	Toronto	21-6-40
Melanson, J. A.,	Moncton, N.B.	9-8-40
Meltzer, H.,	Ninette, Man.	27-6-41
Mendelson, H. I.,		20-4-42
Merritt, J. W.,	Waterloo, Ont.	4-9-39
M'Gonigle, A. C.,	Toronto	16-9-40
Middleton, W. W.,	London, Ont.	31-5-41
Midgley, G. H.,	Galt, Ont.	10-2-41
Miller, B. F.,	New Waterford, N.S	1-2-40
Miller, B. C.,	Kingston, Ont.	2-9-39
Miller, J. MacG.,	Moose Jaw, Sask.	8-9-39
Miller, J. S.,	Halifax, N.S.	9-9-39
Mills, J. R. F.,	Toronto	2-7-40
Miller, S.,	Lachine, Que.	20-7-42
Milne, D. R. S.,	Vancouver	11-11-40
Milner, F. J.,	London, Ont.	20-6-40
Minnes, A. G.,	Niagara Falls, Ont	1-1-40
Minshull, F. A.,	Halifax, N.S.	4-7-40
Mirsky, S.,	Ottawa	2-9-39
Misener, C. C.,	Crediton, Ont.	16-7-40
Mitchell, H. S.,	Montreal	20-5-40
Mitchell, J.,	Maple Creek, Sask.	10-4-42
Moll, A. E.,	Montreal	4-1-40
Montgomery, L. C.,	Westmount, Que.	15-6-40
Montgomery, R. C.,	Toronto	1-9-39
Montgomery, S. R. P.,	Toronto	11-11-42
Mooney, W. C.,	Vancouver	1-6-41
Morgan, G. S.,	Montreal	2-9-39
Morin, J. E.,	Quebec	1-9-39
Morton, W. A.,	Broxburn, West Lothian, Scotland	2-1-42
Muir, J. A.,	Port Hawkesbury, N.S.	15-2-40
Muirhead, W. R.,	Carleton Place, Ont.	16-10-39
Mulligan, C. V.,	Toronto	3-9-39
Mundell, C. D. T.,	Montreal	8-6-40
Munro, C. B.,	London, Ont.	21-9-40
Murtagh, A. P.,	Timmins, Ont.	15-6-40
Mutrie, R. R.,	Guelph, Ont.	4-9-39
Myers, C. A.,	Brussels, Ont.	7-12-40
Myers, R. F. M.,	Winnipeg	23-5-41

Name	Address	Date of Appointment
Needham, W. LaV.,	London, Ont.	23-7-41
Negru, J. H.,	Montreal	14-3-40
Neilson, J. B.,	Hamilton, Ont.	10-2-41
Neilson, J. P.,	Debolt, Alta.	30-5-41
Nichol, J. E.,	Ottawa	29-9-41
Nicholson, J. F.,	Sydney, N.S.	13-5-40
Nicholson, M. A.,	Victoria, B.C.	9-9-39
Nixon, J. R.,	Edmonton, Alta.	6-9-39
Noble, J. A.,	Halifax, N.S.	2-9-39
Norris, R. L.,	Wyoming, Ont.	18-6-40
Norton, G. I.,	Cardston, Alta.	19-2-40
O'Brien, H. D.,	Halifax, N.S.	1-6-40
O'Hara, A. S.,	Sioux Lookout, Ont.	1-9-39
Ohlke, R. F.,	Parry Sound, Ont.	2-6-41
Oille, W. A.,	Toronto	22-5-40
Oliver, G. D.,	Vancouver	25-1-41
Orchard, C. B.,	Tisdale, Sask.	2-5-41
Ostiguy, L.,	Montreal	5-4-40
Overholt, A. A.,	Brantford, Ont.	12-9-39
Pace, F. C.,		1-9-39
Palmer, J. H.,	Westmount, Que.	15-6-40
Palmer, R. A.,	Vancouver	1-2-42
Parney, F. S.,	London, Eng.	14-9-40
Pascoe, W. W.,	Wakan, Sask.	18-5-42
Patten, R. W.,	Chilliwack, B.C.	15-5-41
Patterson, E. B.,	Paris, Ont.	13-7-40
Paterson, J.,	Ottawa	9-10-39
Peco, H. C.,	Wallaceburg, Ont.	7-12-40
Pember, F. R.,	Colborne, Ont.	21-10-40
Perfect, K. E.,	Toronto	21-6-40
Perry, W. H.,	Vancouver	15-12-41
Petrie, J. G.,	Montreal	15-6-40
Pfeiffer, W. M.,	Port Daniel, Que.	14-6-40
Pinch, J. C.,	Guelph, Ont.	4-9-39
Pinder, R. R.,	Dundurn, Sask.	1-8-40
Plante, A. P.,	Cartierville, Que.	4-9-39
Playfair, C. H.,	Hamilton, Ont.	2-9-39
Ployart, C. H.,	Lillooet, B.C.	22-2-40
Pollack, S. L.,	Quebec	11-9-39
Poole, J. C.,	Revelstoke, B.C.	1-8-41
Porter, D. F. W.,	Saint John, N.B.	2-9-39
Portigal, A.,	Winnipeg	17-8-42
Potter, R. T.,	Toronto	1-9-39
Probert, R. I.,	Toronto	1-6-42
Procter, H. A.,	Ottawa	2-9-39
Ptak, L. L.,	Victoria, B.C.	18-2-42
Quehl, E.,	Edmonton, Alta.	11-9-39
Quinn, L. J.,	Montreal	20-5-40
Rabb, H. R.,	Fort Coulonge, Que.	5-6-40
Rae, C. A.,	Toronto	1-9-39
Railton, S. V.,	Port Colborne, Ont.	13-7-40
Ralph, R. E.,	Toronto	16-4-40
Ramsay, F. G.,	Turtle Ford, Sask.	15-6-40
Ranney, M. G.,	Callander, Ont.	25-9-40
Raxlen, B.,	Toronto	29-6-42
Raymond, G. H.,	Montreal	27-9-39
Reid, J. A. G.,	Toronto	18-8-41
Richard, H. L.,	Edmonton, Alta.	29-12-41
Richardson, A. L.,	Petitcodiac, N.B.	4-9-40
Richardson, J. C.,	Toronto	4-1-40
Richardson, R. W.,	Winnipeg	9-9-39
Ritchie, K. S.,	Montreal	27-2-40
Robert, J. M. P. E.,	Montreal	11-8-41
Robertson, C. T.,	Toronto	13-6-40
Robertson, D. P.,	Toronto	24-6-40
Robertson, H. R.,	Montreal	20-5-40
Robertson, H. A.,	Vancouver	1-10-39
Robertson, J. A.,	Campbellford, Ont.	6-10-41
Roderick, J. H.,	Ancaster, Ont.	29-5-40
Rodger, W. S.,	Cowansville, Que.	12-5-41
Rose, W. H.,	Potsdam, N.Y.	4-10-40
Ross, A.,	Montreal	7-6-41
Ross, E. F.,	Halifax, N.S.	1-9-39
Rothwell, J. C.,	Quebec	5-4-40
Rowed, R. B.,	Vancouver	22-2-42
Roxborgh, D. B.,	Victoria, B.C.	15-2-42
Rumball, A. St. C.,	Brandon, Man.	11-9-39
Ryan, C. A.,	Vancouver	27-7-40
Ryan, P. A.,	Toronto	25-5-40
Salsbury, C. R.,	Kingston, Ont.	28-3-40
Salter, A. W.,	Wynyard, Sask.	29-5-41
Sarjeant, T. R.,	Toronto	1-9-39
Saxton, G. D.,	Ocean Falls, B.C.	1-9-41
Scarrow, G. R.,	Sarnia, Ont.	1-9-39
Scharfe, E. E.,	Montreal	15-6-40
Scheinert, J.,	Penetang, Ont.	7-9-40
Schoemperlen, C. B.,	St. Vital, Man.	27-12-39
Schroeder, F. W.,	Regina, Sask.	6-11-39
Scott, H.,	Vancouver	3-6-40
Scott, P. A.,	Picton, Ont	10-6-40
Scott, W. A.,	Guelph, Ont.	1-4-41
Scott-Moncrieff, R.,	Victoria, B.C.	6-9-39
Searle, A.,	Winnipeg	4-7-41
Secter, M. B.,	Buchanan, Sask.	19-5-41
Selznick, M. W.,	Toronto	14-9-40
Senecal, J. G.,	St. Paul L'Abbotsford, Que.	8-3-42
Shannon, J. G.,	Montreal	20-5-40
Share, M.,	Edmonton, Alta.	23-7-41
Shaw, A. G.,	Toronto	1-9-39
Shaw, J. H.,	Charlottetown, P.E.I.	1-8-40
Sherk, B. E.,	Fenwick, Ont.	2-11-40
Shier, S. G. U.,	**Toronto**	**1-1-40**
Shipp, F. L.,	Forest Hill Village, Ont.	1-9-39
Sieniewicz, T.,	Halifax, N.S.	2-9-39
Sills, H. L.,	Windsor, Ont.	13-1-41
Simard, M. P.,	Rimouski, Que.	19-8-41
Sinclair, G. A.,	Grimsby, Ont.	18-9-39
Singleton, A. C.,	Toronto	1-9-39
Sidenberg, R. E.,	Toronto	6-7-42
Skinner, F. L.,	Saskatoon, Sask.	15-5-42
Slack, W. R. L.,	Trenton, Ont.	1-9-39
Slayter, J. H.,	Dartmouth, N.S.	11-11-39
Slocombe, G. W.,	Selkirk, Ont.	1-7-42
Smith, G. F.,	Toronto	11-1-40
Smith, G. L. M.,	Ottawa	1-9-39
Smith, H. D.,	Montreal	29-6-42
Sneath, P.,	Georgetown, British Guiana	8-7-40
Sommerville, A. N.,	Winnipeg	18-6-40
Sparling, D. W.,	Montreal	1-12-39
Spence, J. M.,	Toronto	14-7-40
Spence, P. McK.,	Toronto	8-6-40
Spencer, E. W.,	Saskatoon, Sask.	15-7-40
Spooner, C. M.,	Toronto	2-9-39
Spooner, E. G.,	Regina, Sask.	23-12-40
Spooner, H. J.,	Regina, Sask.	4-9-39
Statten, T.,	Toronto	1-4-41
Stephen, H. M.,	Kingston, Ont.	1-9-39
Stephens, C. W.,	Vermilion, Alta.	18-5-42
Stevenson, R. H.,	Montreal	1-9-39
Stewart, A. J.,	Vancouver	22-7-40
Stewart, N. B.,	Huntingdon, Penn.	1-7-42
Stewart, O. W.,	Montreal	4-1-40
Stiles, E.,	Albert, N.B.	6-9-40
Stockwell, W. C.,	Montreal	20-5-40
Stoker, G. L.,	Vancouver	4-1-40
Strain, F. A.,	Gore Bay, Ont.	26-7-40
Strashin, I.,	Toronto	11-8-42
Stratton, H. G.,	New Toronto, Ont.	1-3-40
Stuart, L. M.,	Guelph, Ont.	4-9-39
Sturdy, J. H.,	Revelstoke, B.C.	4-9-39
Sutherland, J. W.,	Amherst, N.S.	1-9-39
Sutherland, D. R.,	Halifax, N.S.	7-12-39
Sutton, I.,	Long Branch, Ont.	1-3-40
Swalsky, M.,	Lachine, Que.	23-4-42
Talbot, H. S.,	Brewster, N.Y.	18-9-41
Tanner, A. R.,	Punnichy, Sask.	27-12-39
Tanton, G. P.,	Port Duffevin, N.S.	31-10-39
Tanzman, J.,	Saint John, N.B.	28-9-39
Taylor, C. D.		15-10-39
Taylor, G. D.,	Montreal	25-9-40
Taylor, R. M.,	Toronto	1-4-41
Tellson, A. G.,	Toronto	24-3-41
Templeton, D. W.,	Kingston, Ont.	24-6-40
Thompson, C. S.,	Hampstead, Que.	1-7-41
Thomson, J. A. C.,	Toronto	11-1-40
Tieman, E. E.,	Ottawa	1-9-39
Tilley, J. V.,	Toronto	10-6-40
Tisdale, P. K.,	Winnipeg	27-12-39
Tomlinson, G.,	Moose Jaw, Sask.	4-9-39
Torrance, T. L.,	Wingham, Ont.	5-9-40
Tovee, E. B.,	Toronto	1-4-41
Townsend, H. J.,	Louisburg, N.S.	25-7-40
Tritt, J. H.		18-8-41
Trudelle, J. B.,	Regina, Sask.	15-7-40
Tucker, G. N.,	Edmonton, Alta.	15-8-41
Turcot, E. A.,	Montreal	15-6-40
Urquhart, A. M.,	Preston, Ont.	1-6-40
Vaisrub, S.,	Prince Albert, Sask.	12-5-41
Vaile, B. W.,	Toronto	13-7-40
Vallee, A.,	Quebec	3-9-40
Vandervoort, E. C.,	New Glasgow, N.S.	1-4-41
Van Nostrand, F. H.,	Toronto	1-9-39
Van Wyck, N.,	Westmount, Que.	8-9-39
Vining, J. A.,	Toronto	25-11-40
Voloshin, P. C.,	Saskatoon, Sask.	30-6-42
Wadup, R. S.		6-6-42
Wainwright, G. A.,	Hamilton, Ont.	
Wales, W. F.,	Toronto	21-11-40
Walker, N. L.,	Orillia, Ont.	5-2-41
Wallace, W. M.,	Massey, Ont.	7-7-41
Walmsley, J. F. S.,	Hamilton, Ont.	30-9-40

Name	Address	Date of Appointment
Walters, C. H. A.,	Belleville, Ont.	13-6-40
Walton, C. H. A'C.,	Winnipeg	1-9-39
Walton, F. A'C.,	Kelwood, Man.	12-9-41
Warren, W. J.,	Alex, Alta.	25-2-41
Watkinson, E. A.,	Kingston, Ont.	6-10-39
Watson, C. A.,	Victoria, B.C.	6-9-39
Watson, G. L.,	Vancouver	8-1-42
Watson, M. C.,	Toronto	1-3-41
Weingarten, I. P.,	Toronto	29-6-42
Weinlos, C. H.,	Edmonton, Alta.	6-9-39
Weinloss, M.,	Edmonton, Alta.	6-9-39
Wells, J. P.,	Orillia, Ont.	7-9-39
West, W. G.,	Woodstock, Ont.	7-12-40
White, A. W. McC.,	Toronto	1-9-39
White, E. P.,	Kingston, Ont.	9-3-40
White, W. H.,	Penticton, B.C.	5-1-42
Whitman, R. L.,	Vancouver, B.C.	6-6-41
Wight, G. E.,	Montreal	11-9-39
Wiglesworth, F. W.,	Montreal	15-6-40
Wilder, E. M.,	Killam, Alta.	14-5-41
Will, R. E.,	Barrie, Ont.	23-6-41
Williams, C. McA.,	Charlottetown, P.E.I.	2-9-39
Williams, H. A.,	Kitchener, Ont.	16-7-40
Williams, H. I.,	Montreal	2-7-41
Williams, J. V.,	Kingston, Ont.	1-9-39
Williams, W. O.,	North Augusta, Ont.	28-6-40
Willis, E. A.,	Seeley's Bay, Ont.	10-6-40
Wilson, K. E. G.,	Ottawa	19-6-41
Wilson, W. M. G.,	Kamloops, B.C.	17-6-40
Wodehouse, G. E.,	Ottawa	30-6-41
Wolstein, E.,	Ottawa	2-9-39
Wood, C. G.,	Kingston, Ont.	1-9-39
Wride, R. J.,	Princeton, B.C.	7-1-41
Wright, J. A.,	Vancouver	22-1-40
Wyatt, J. P.,	Toronto	1-7-41
Yaffe, S. A.,	Hamilton, Ont.	26-10-42
Young, D. A.,	Ottawa	23-9-39
Young, E. J.		1-9-39
Young, H. G.,	Moose Jaw, Sask.	6-7-40
Young, J. A. F.,	Pictou, N.S.	29-5-40
Young, S.,	Moose Jaw, Sask.	19-2-41

SECTION III

Showing date of Appointment and Retirement as at November 30, 1942

Allison, G., Picton, Ont.
17-10-40 App. 31-5-41 SOS*

Anderson, H. J., Fort San, Sask.
15-7-40 App. 20-5-41 SOS

Anderson, W. H. K., Vancouver
16-9-39 App. 31-7-41 SOS

Arthur, C. L. T., Winnipeg
1-9-39 App. 13-6-41 SOS

Baker, H., Toronto
15-7-42 App. 16-10-42 SOS

Baker, R. H., Harrow, Ont.
7-2-41 App. 6-2-42 SOS

Banting, F. G., Toronto (Dead)
1-9-39 App. 21-2-41 SOS

Bennett, S. Z., Vancouver
22-7-41 App. 31-12-41 SOS

Benton, C., Apple Hill, Ont.
20-7-40 App. 12-9-41 SOS

Blake, J. J., Charlottetown, P.E.I.
1-9-39 App. 17-9-40 SOS

Bolduc, W., Montreal
1-12-41 App. 30-4-42 SOS

Bourque, E. G., Dorchester, N.B.
9-10-40 App. 18-4-42 SOS

Bouthillier, G., Shediac, N.B.
1-9-40 App. 30-6-42 SOS

Boyd, J., Hamilton, Ont.
15-11-39 App. 20-1-42 SOS

Brock, W. G., Winnipeg
4-2-41 App. 29-9-41 SOS

Buckley, F. J., Ottawa
5-8-40 App. 30-4-41 SOS

Burns, G. R., Halifax, N.S. (Dead)
1-9-39 App. 15-11-41 SOS

Campbell, I. P., Wroxeter, Ont.
14-9-40 App. 31-10-41 SOS

Campbell, R. McC., Toronto
23-4-41 App. 18-6-42 SOS

Campbell, S. M., Toronto
1-9-39 App. 13-10-42 SOS

Carr, W. M., Winnipeg
17-6-40 App. 31-10-42 SOS

Carreau, A., Verdun, Que.
1-2-41 App. 1-6-42 SOS

Chalmers, G. E. N., Fredericton, N.B.
2-9-39 App. 12-10-39 SOS

Chapman, H. L., Port Arthur, Ont.
3-7-41 App. 6-10-42 SOS

Charbonneau, A. J. H., La Patrie, Que.
29-6-40 App. 9-12-40 SOS

Charpentier, C. J., Montreal
24-7-41 App. 15-5-42 SOS

Childe, A. E., Montreal
4-1-40 App. 5-12-41 SOS

Choiniere, J. O., Granby, Que.
22-12-41 App.

Claridge, V. O., Tottenham, Ont.
19-9-40 App. 30-6-41 SOS

Clarke, F. S., Montreal
13-8-40 App. 3-7-41 SOS

Clendenan, D. G., Hamilton, Ont.
24-2-42 App. 4-5-42 SOS

Cone, W. V., Montreal
4-1-40 App. 31-12-41 SOS

Cornett, W. G. B., Hamilton, Ont.
31-1-40 SOS

Creasy, G. J., Brandon, Man.
28-5-40 App. 15-7-40 SOS

Crutchlow, E. F., Westmount, Que.
26-7-40 App. 7-2-41 SOS

Davis, E. G., London, Ont.
19-11-39 App. 17-8-42 SOS

Des Braisey, H. A., Vancouver
1-9-39 App. 6-7-42 SOS

Desjardins, J., St. Marc Des Carrieres, Que.
3-10-39 App. 9-4-41 SOS

Desmond, F. J., Moncton, N.B.
13-11-40 App. 17-6-42 SOS

Donnelly, F. R., Chesterville, Ont.
17-3-41 App. 9-8-41 SOS

Elliott, H. N., Mimico, Ont.
23-9-39 App. 31-3-40 SOS

Embree, W. H., Stellarton, N.S.
(Dead) 26-12-39 App. 24-4-41 SOS

Fawcett, J. P., Hamilton, Ont.
22-9-39 App. 15-6-40 SOS

Fox, C. B., St. John's, Nfld.
4-6-40 App. 19-10-40 SOS

Fuller, G. F. LeR., Cowansville, Que.
7-8-40 App. 6-5-41 SOS

Galbraith, A. C., Montreal, Que.
2-7-40 App. 30-7-41 SOS

Garneau, P. E., Quebec (Dead)
18-9-40 App. 12-3-41 SOS

Gerrie, J. W., Hampstead, Que.
20-5-40 App. 25-12-41 SOS

Gibbon, A. D., Saint John, N.B.
2-9-39 App. 19-11-39 SOS

Girard, J. A., Quebec
1-9-39 App. 16-1-40 SOS

Gordon, J. K., Montreal
20-5-40 App. 7-2-42 SOS

Graham, H. McK., Regina, Sask.
16-1-40 App. 20-8-42 SOS

Grandbois, J., Quebec
25-4-41 App. 19-9-41 SOS

Gray, H. M., Toronto
1-9-39 App. 5-3-41 SOS

Grieve, H. G., Winnipeg
10-7-40 App. 3-4-41 SOS

Gilhuly, I. K., Rapid City, Man.
14-6-41 App. 27-10-42 SOS

Hanson, F. R., Montreal
4-1-40 App. 30-4-42 SOS

Hayes, R. T., Saint John, N.B.
2-9-39 App. 15-11-39 SOS

Heil, M. A., Timmins, Ont.
7-7-41 App. 16-10-42 SOS

Helliwell, P. V., Toronto
24-7-41 App. 21-7-42 SOS

Hickey, M. A., Montreal
10-10-42 SOS

Higgs, W. D., Cobble Hill, B.C.
22-6-40 App. 6-12-40 SOS

Hollenberg, J., Winnipeg
31-7-42 App. 1-10-42 SOS

Humphreys, S. P., Montreal
4-1-40 App. 30-4-42 SOS

Hunter, J. E., London, Ont.
1-9-39 App. 15-11-40 SOS

Inksater, H. R., Calgary, Alta. (Dead)
7-8-41 App.

Irving, J. A., Ottawa
1-9-39 App. 31-12-41 SOS

Irving, R. W., Centreville, N.B.
15-11-39 App. 10-9-40 SOS

Jones, A. L., Victoria, B.C.
13-1-40 App. 15-4-42 SOS

Jordan, F. B., Vancouver
12-11-40 App. 11-6-41 SOS

Kaufmann, M., Westmount, Que.
15-6-40 App. 31-7-41 SOS

Keillor, C. M., Ottawa
15-6-40 App. 31-12-41 SOS

Kinley, C. E., Halifax, N.S.
1-6-40 App. 1-10-41 SOS

Kippen, J. W., Winnipeg (Dead)
27-5-40 App. 1-5-41 SOS

Kirk, J. G., Listowel, Ont.
25-11-39 App. 13-10-42 SOS

* Struck off strength.

Lachance, M., Quebec
4-3-41 App. 9-7-42 SOS
Lafleur, P. J. A., Montreal
1-3-40 App. 9-9-40 SOS
Laird, A. F., Owen Sound, Ont.
25-9-40 App. 25-11-41 SOS
Lamb, W. V., Camrose, Alta.
1-6-41 App. 10-9-41 SOS
Lamond, W. J., Sydney Mines, N.S.
1-9-39 App. 9-8-40 SOS
Laroche, M., Ste. Croix, Que.
1-6-41 App. 5-12-41 SOS
Larocque, E., Plantagenet, Ont.
10-7-41 App. 2-1-42 SOS
Le Blond, W., Quebec
9-9-39 App. 7-6-40 SOS
Legate, D. M. DeC., Montreal
1-9-39 App. 31-5-41 SOS
Lesage, H. J., Quebec 4-1-40 App.
Levie, R. H., Quebec
18-6-40 App. 18-4-42 SOS
Lizotte, F., Levis, Que.
1-9-39 App. 11-6-40 SOS

Macey, H. P., Frelighsburg, Que.
3-9-40 App. 6-4-42 SOS
MacIntosh, E. F., Morrisburg, Ont.
25-9-40 App. 9-8-41 SOS
MacKenzie, J. C., Montreal
26-7-40 App. 30-6-42 SOS
MacLellan, R. W., Halifax, N.S.
(Dead) 1-4-40 App. SOS
MacMillan, C. W., Rothesay, N.B.
22-11-39 App. 18-4-40 SOS
Marshall, H. A., London, Ont.
15-9-39 App. 20-3-41 SOS
Massig, E., Regina, Sask.
1-9-39 App. 30-6-40 SOS
Medway, J. G., Winnipeg
20-6-41 App. 3-4-42 SOS
Miller, C. A., Beaver Lodge, Alta.
15-12-41 App. 22-9-42 SOS
Millman, W. S., Oshawa, Ont.
21-9-39 App. 28-5-40 SOS
Morson, W. G., Halifax, N.S.
1-2-40 App. 8-4-42 SOS
Munro, J. M., Odessa, Ont.
16-9-40 App. 29-7-41 SOS
Murray, J. A., Sydney, N.S. (Dead)
1-9-39 App. SOS
McCartney, G. E., Fort William, Ont.
22-9-39 App. 17-4-41 SOS
McClatchie, S., Vancouver
15-9-39 App. 23-1-42 SOS

McCormick, C. P., Toronto
7-2-40 App. 6-11-41 SOS
McCouan, W., Toronto
28-3-42 App. 25-4-42 SOS
McCallum, W. McK., Vancouver
1-9-41 App. 26-10-42 SOS
McDonald, J. A., Prince Albert, Sask.
(Dead) 15-7-40 App. 6-11-40 SOS
McInnis, J. G., Mount Pleasant, Ont.
8-4-40 App. 28-2-41 SOS

Nesbitt, J. H., Toronto
1-7-40 App. 4-4-41 SOS
Nettleton, E. W., Toronto
23-9-40 App. 22-2-41 SOS
Nykiforuk, N. E., Edmonton, Alta.
28-9-40 App. 27-4-42 SOS

Olson, B. H., Winnipeg
22-5-40 App. 13-12-41 SOS
Owen, E. F. D., Ottawa
24-6-40 App. 31-5-41 SOS

Park, M. O., Robeline, Louisiana
30-9-41 App. 24-2-42 SOS
Park, S., Arthur, Ont. (Dead)
10-9-40 App.
Petitclerc, L. K., St. Augustin, Que.
1-9-39 App. 1-8-40 SOS
Potter, J. L., Victoria, B.C.
1-9-39 App. 4-7-40 SOS

Rabinowitch, I. M., Montreal
1-6-40 App. 28-2-42 SOS
Ratz, R. G., Kitchener, Ont.
16-7-40 App. 1-6-42 SOS
Rice, L. W., Montreal
12-2-41 App. 17-4-42 SOS
Richardson, T. M., Verdun, Que.
1-9-40 App. 17-1-42 SOS
Robertson, H., Halifax, N.S.
1-9-39 App. 28-7-41 SOS
Ruddick, W. W., Montreal
5-4-40 App. 26-5-42 SOS
Russel, C. K., Montreal
2-10-39 App. 23-7-42 SOS
Rykert, H. E., Toronto
1-9-39 App. 26-5-42 SOS

Saunders, T. F., Vancouver
14-3-40 App. 27-1-42 SOS
Scott, A. W., Banff, Alta.
5-9-39 App. 25-6-41 SOS
Scott, F. M., Toronto
20-11-41 App. 31-5-42 SOS
Slater, Charles, South Ozone Pk., N.Y.
(Dead) 3-4-41 App. 22-8-41 SOS
Smith, G. L., Charlottetown, P.E.I.
2-9-39 App. 23-10-40 SOS
Smith, L. A. E., Souris, Man.
3-2-40 App. 5-5-40 SOS
Sutherland, T. W., Revelstoke, B.C.
8-10-40 App. 18-9-42 SOS

Taylor, G. W., Tara, Ont.
13-6-40 App. 9-12-40 SOS
Taylor, W. R., Toronto 10-11-42 SOS
Tedford, J. McG., McCreary, Man.
9-9-39 App. 15-11-40 SOS
Tessier, J. E. A., Quebec
1-9-39 App. 7-11-41 SOS
Tiffin, E. R., Wallaceburg, Ont.
10-9-40 App. 30-9-41 SOS
Turcotte, M., St. Raphael de Bell, Que.
4-6-41 App. 8-5-42 SOS

Urquhart, R. W. I., Toronto
1-9-39 App. 25-2-42 SOS

Viereck, H. C., Brooklyn, N.Y.
19-5-42 App. 20-8-42 SOS
Vosburgh, J. W., New Westminster, B.C. 26-9-39 App. 22-11-40 SOS

Waller, K. B., Rockwood, Ont.
4-9-39 App. 18-11-42 SOS
Walsh, A. C., Saskatoon, Sask.
31-1-41 App. 8-12-41 SOS
Wansbrough, R. M., Toronto
1-9-39 App. 22-3-42 SOS
Washburn, R. T., Edmonton, Alta.
1-9-39 App. 5-6-40 SOS
White, J. W., Toronto
1-9-39 App. 7-1-41 SOS
White, J. B., Atlanta, Ga.
1-10-41 App. 31-5-42 SOS
Wiggins, R. H., Sussex, N.B.
5-9-40 App. 11-2-41 SOS
Wilson, D. C., Hamilton, Ont.
7-7-41 App. 6-8-42 SOS
Wood, D. MacL., Limerick, Sask.
12-7-40 App. 23-9-42 SOS

Zumstein, G. T., St. Catharines, Ont.
5-7-40 App. 15-2-42 SOS

SECTION IV

Appointments in December, 1942

Name	*Address*	*Date of Appointment*
Aitken, G. W. A.	London, Ont.	14-9-42
Aronovitch, M.	Montreal	1-12-42
Bolley, H.	Toronto	18-11-42
Bell, T. A.	Taber, Alta.	14-12-42
Berjansky, C. A.	Rimbey, Alta.	7-12-42
Brotman, E. H.	Vanguard, Sask.	16-11-42
Buchanan, D. R.	Lethbridge, Alta.	14-12-42
Clarke, A. McM.	Saint John, N.B.	
Decter, P. H.	Winnipeg	27-11-42
Demers, L. P. E.		15-12-42
Des Trois Maisons, R.	Montreal	1-12-42
Doan, H. I.	Harrietsville, Ont.	
Downey, J. L.	Winnipeg	1-12-42
Earn, A. A.	Elnora, Alta.	28-11-42
Endicott, W. J.	Trail, B.C.	1-12-42
Ewing, D.	Kitchener, Ont.	
Fortin, J. N.	Verdun, Que.	29-10-42
Fratkin, L. B.	Edmonton, Alta.	14-12-42
Gross, R. C.	Ottawa	15-12-42
Hall, W. F. M.		14-12-42
Hedges, L. S.		
Jamieson, C. A.	Calgary, Alta.	8-12-42
Kirkpatrick, G. J. A.	Comox, B.C.	10-12-42
Konkin, A. D.	St. Catharines, Ont.	1-12-42
Lebetter, T. A.	Yarmouth, N.S.	17-9-42
Maclennan, A. H.	Edmonton, Alta.	15-12-42
Miller, R. G.	Kingston, Ont.	20-11-42
Morden, J. R. E.	Brantford, Ont.	15-12-42
McIntyre, J. M.	Montreal	1-12-42
Pion, P. P.	Montreal	14-12-42
Rankin, R. W.	Toronto	
Richman, N.A.		14-12-42
Rickard, J. H.	Toronto	18-11-42
Roy, C.	Shawinigan Falls, Que.	7-12-42

Name Address	Date of Appointment
Sagar, H. S., Hamilton, Ont.	14-12-42
Saint Martin, M., Montreal	1-12-42
Shleser, I. H., Chicago, Ill.	
Smit, J. S., Van Kleek Hill, Ont.	
Sommers, J., Toronto	
Solway, S. H., Toronto	23-11-42
Stoffman, I. W., Weyburn, Sask.	28-11-42
Sumner, W. G., London, Ont.	
Walters, W. R., Toronto	3-11-42
Wilson, F. L., Trail, B.C.	1-12-42
Calarco, J. A., Toronto	20-11-42

Medical Officers Struck off Strength During December, 1942.

Boult, G. F., Winnipeg
Byrne, C. J.
Demers, L. P. E.
Millions, J. V., Westlock, Alta.

MEDICAL OFFICERS ROYAL CANADIAN AIR FORCE

As of January 1, 1943. All of Temporary Rank

(The prefix (O) indicates service overseas and (×) means service in the last war. A.A.F. is Auxiliary Air Force. The last column shows date on which temporary rank was granted.)

Group Captain

Tice, J. W. (A.A.F.)	15-10-41
(O)Hunter, J. E.	15-10-41

Hon. Wing Commander

Dowd, K. E.	25-10-41

Wing Commanders

Peacock, H. A. (A.A.F.)	16-11-40
(×)Chalk, S. G., M.M.	16-11-40
Hall, G. E.	1-2-41
(O)Tilley, A. R. (A.A.F.)	1-3-41
Kelly, A. D.,	1-3-41
Mathewson, F. A. L. (A.A.F.)	1-3-41
Noble, E. C.	1-3-41
Emard, J. M. L.	15-6-41
Barr, M. L.	15-7-41
(O)Growse, J. M.	15-7-41
Corbet, A. A. G.	15-7-41
Sifton, J. A.,	15-7-41
Day, E. E. (A.A.F.)	15-9-41
Tisdall, F. F. G.	31-10-41
Leggett, L. H.	15-1-42
Smith, H. G.	1-6-42
Mitchell, H. D.	1-6-42
Weber, W. H.	1-6-42

Squadron Leaders

Helliwell, M. R.	1-3-36
Cranfield, H. V.	1-2-41
Hanna, H. E.	1-3-41
Cheesman, F. J.	1-3-41
Oborne, H. G.	1-3-41
Hessian, B. L.	1-3-41
(O)Sinclair, J. D.	1-3-41
(O)Stone, A. C.	1-3-41
(Act. W.C.)	15-9-42
(O)Whyte, J. C.	1-3-41
(O)Whaley, J. B.	1-3-41
Fergusson, E. A.	1-3-41
Elder, G. G.	14-5-41
Rankin, W. D. (A.A.F.)	15-6-41
Lawson, R. N.	15-6-41
Finlayson, W.	1-7-41
Baxter, R. G.	1-7-41
(O)Maclachlin, I. K.	1-8-41
Franks, W. R.	1-8-41
(O)Brown, W. F.	1-8-41
(Act. W.C.)	1-6-42
Campbell, E. O. F.	1-8-41
Jay, H. J. D.	1-8-41
Gamble, J. E. D.	15-8-41
Meakins, J. F.	1-9-41
Goddard, J. C.	1-9-41
(O)Coleman, H. M.	1-9-41
(O)Hiltz, J. W.	1-9-41
Running, K. H.	1-1-42
Kreiner, J. H.	1-1-42
MacLean, M. S.	1-1-42
Marshall, W. D.	1-1-42
Westcott, D. B.	1-1-42
Hubbs, D. H.	12-1-42
Boyd, C. G.	15-1-42
Lees, J. M. M.	1-2-42
Latchford, J.	1-2-42
O'Connell, J. L.	1-2-42
Colquhoun, J. D.	1-2-42
Williams, L. J.	1-2-42
Tauer, C.	1-2-42
Racicot, L. H.	1-2-42
(O)Stewart, C. B.	1-2-42
Dupuis, J. G. Y. R.	1-2-42
Ryan, E. J.	1-2-42
Grant, D. M.	15-5-42
Badger, G. A.	15-5-42
Perley, D. A.	15-5-42
Douglas, G. R.	15-5-42
Hopkirk, J. F.	15-5-42
Wilson, C. T.	15-5-42
MacDonald, J. D. C.	15-5-42
Dillane, J. E.	1-6-42
(O)Kirk, T. E.	1-6-42
(O)McCallum, R. F.	1-6-42
Reid, W. J.	1-6-42
Calvert, K. G.	1-6-42
Clark, J. R.	1-6-42
Buck, C. A.	15-7-42
Easton, D. R.	15-7-42
Sharpe, J. E.	15-7-42
Sellers, A. H.	15-7-42
Ferguson, J. K. W.	15-7-42

Flight Lieutenants

Deasum, L. G. C.	30-4-40
Hicks, M. W.	1-6-40
Demers, M. J. E. C.	10-8-40
Cork, J. F.	1-9-40
(Act. S.L.)	1-1-42
MacLennan, I. A.	21-9-40
McGugan, R. G.	24-9-40
Kenyon, J. M.	29-9-40
Moorhouse, C.	24-9-40
Williams, M. D.	24-9-40
(Act. S.L.)	15-2-42
Warren, C. M.	24-9-40
Peart, J. A.	24-9-40
Lapin, A. W.	29-9-40
(Act. S.L.)	1-6-42
Bradley, G. C.	24-9-40
(Act. S.L.)	15-12-42
(O)Riley, H. W.	24-9-40
Johnston, J. C.	29-9-40
(Act. S.L.)	1-12-42
Brewster, W. R.	24-9-40
(Act. S.L.)	15-2-42
Caughey, G. C.	24-9-40
(O)Cohen, A.	24-9-40
(O)Duncan, B. P.	24-9-40
(O)Foster, N. E.	24-9-40
(Act. S.L.)	15-11-42
Gray, R. C. V.	24-9-40
(O)Kyle, C. A.	24-9-40
(O)Metzler, W. St. G.	24-9-40
McManus, F. R.	24-9-40
(Act. S.L.)	1-7-42
Nodwell, G. R.	24-9-40
(Act. S.L.)	15-6-42
(O)Sweet, T. A.	24-9-40
(Act. S.L.)	7-1-42
Taylor, R. G.	24-9-40
Graham, G. H.	24-9-40
(Act. S.L.)	1-12-42
Nelson, D. G. M.	24-9-40
Doyle, H. S.	24-9-40
(O)Hall, G. R.	24-9-40
Graham, D. C.	24-9-40
Lee, C. C.	24-9-40
Caldbick, G. D.	29-9-40
Burt, C. F.	8-10-40
(Act. S.L.)	15-2-42
Westman, E. R.	8-10-40
(Act. S.L.)	15-11-42
Evelyn, K. A.	16-10-40
(Act. S.L.)	1-6-42
(O)Payette, J. M. H.	17-10-40
Armstrong, J. C.	12-11-40
(Act. S.L.)	1-12-42
Palmer, J. G.	12-11-40
Nash, E. T. W.	12-11-40
(O)Kemp, W. N.	12-11-40
(Act. S.L.)	1-7-41
Johnston, J. G.	12-11-40
Williams, A. D.	12-11-40
(Act. S.L.)	15-10-42
Smith, G. L.	12-11-40
Leonard, J. C. A.	12-11-40
Montreuil, L. F. P. M.	12-11-40
MacDonald, D. C.	12-11-40
Israels, S.	12-11-40
Riddell, W. G.	12-11-40
(O)McAlpine, H. T.	12-11-40
Heard, S.	13-11-40
(Act. S.L.)	15-11-42
Clare, R. M.	13-11-40
(Act. S.L.)	1-9-42
Spaner, S.	13-11-40
(O)MacPhee, A. C.	13-11-40

Flight Lieutenants—*Continued*

Avery, J. F. G. 13-11-40
(Act. S.L.) 1-12-42
Hogg, J. H. S. 16-11-40
Brillinger, H. R. 19-11-40
Minnes, H. E. 26-11-40
Brault, J. I. R. 29-11-40
Bradley, L. O. 16-12-40
Marquis, J. A. D. 16-12-40
(Act. S.L.) 1-6-42
Rose, A. 16-12-40
Eaglesham, F. C. 16-12-40
Perverseff, J. J. 16-12-40
Blair, W. E. 16-12-40
(O)Williams, M. F. 16-12-40
(O)Feller, J. 16-12-40
Attridge, F. R. 16-12-40
Blair, A. C. 16-12-40
(O)Lundy, F. E. 16-12-40
Barker, C. S. 16-12-40
(O)Cadham, R. G. 16-12-40
Peloquin, G. E. C. 16-12-40
Buntain, J. H. 16-12-40
Piche, J. G. M. D. 16-12-40
Aiken, J. B. 16-12-40
Green, J. W. 16-12-40
(O)Storey, R. N. 16-12-40
(Act. S.L.) 15-11-42
(O)Wilson, C. S. 16-12-40
(Act. S.L.) 7-5-41
Male, R. W. 17-12-40
Burnett, R. R. 18-12-40
Elias, J. C. 28-12-40
Crisp, A. G. 15-1-41
Porter, J. J. 1-2-41
Cleghorn, I. M. 5-2-41
(Act. S.L.) 1-6-42
Kinsey, P. 11-2-41
(Act. S.L.) 1-10-42
Wall, M. D. 11-2-41
Matthews, R. M. 11-2-41
Barton, F. C. 11-2-41
Christie, D. 11-2-41
(Act. S.L.) 15-6-42
Mather, J. M. 11-2-41
(Act. S.L.) 1-6-42
Turner, J. G. 11-2-41
Hargrove, W. A. 11-2-41
Dooley, R. J. 11-2-41
Arthur, J. F. 11-2-41
Riddell, A. 11-2-41
Howell, P. T. W. 11-2-41
MacKay, I. E. 11-2-41
Young, A. E. 11-2-41
(Act. S.L.) 15-12-42
Hall, A. S. 11-2-41
(O)Coles, B. C. 11-2-41
(Act. S.L.) 1-7-42
Manning, G. W. 12-2-41
(Act. S.L.) 1-10-42
Adamson, G. L. 28-3-41
(Act. S.L.) 1-4-42
Lecavalier, E. M. J. U. V. 28-4-41
(Act. S.L.) 1-10-42
Montgomery, R. C. P. 1-5-41
(Act. S.L.) 15-2-42
Fraser, A. M. 3-5-41
McIntyre, J. A. 3-5-41
Cameron, A. A. 3-5-41
Doyle, P. E. 3-5-41
(O)Hagan, J. N. 3-5-41
Hutchison, H. M. 3-5-41
(Act. S.L.) 15-10-42
(O)Hutton, D. V. 3-5-41
Jenner, L. C. 3-5-41
Kennedy, R. 3-5-41
Lawson, G. A. 3-5-41
(Act. S.L.) 1-9-42
Leckie, G. G. 3-5-41
Prieur, O. G. 3-5-41
Ross, H. M. 3-5-41
Sparling, S. E. 3-5-41
Stogdill, C. G. 3-5-41
Thomson, F. B. 3-5-41
Webb, G. A. C. 3-5-41
(Act. S.L.) 15-11-42
Boyle, W. G. 3-5-41
Buchanan, C. A. 3-5-41
(Act. S.L.) 1-6-42
(O)Forsyth, C. W. 3-5-41
Howlett, J. G. 3-5-41
Houze, M. 3-5-41
Kane, L. A. 17-5-41
Vigeant, J. H. E. 18-5-41
(Act. S.L.) 1-10-42
Underhill, A. S. 19-5-41
Pattee, C. J. 3-6-41
Cruikshank, J. M., O.B.E. 6-6-41
(Act. S.L.) 15-2-42
Steart, N. A. 7-6-41
Large, A. W. 20-6-41
Lowenstein, L. 26-6-41
(Act. S.L.) 15-12-42
McKenty, J. S. 7-7-41
Wilson, H. E. 7-7-41
(O)Waddell, J. M. 10-7-41
Manace, G. 10-7-41
McLean, J. A. 10-7-41
Nicholls, J. V. V. 23-7-41
(Act. S.L.) 15-6-42
Hall, C. W. 1-8-41
Smith, R. C. 5-8-41
Munroe, D. S. 5-8-41
Hudson, A. L. 5-8-41
Park, R. J. G. 5-8-41
Steiman, I. 5-8-41
(O)Janes, J. M. 8-8-41
Anderson, G. L. St. C. 9-8-41
(×)Bell, E. G., M.M. 9-8-41
(Act. S.L.) 15-12-42
Mitchell, W. B. 9-8-41
(O)Morton, J. E. C. 9-8-41
Doney, E. H. 9-8-41
Allen, C. S. 17-8-41
Davey, J. F. 18-8-41
(Act. S.Q.O.) 15-10-42
Rose, B. 20-8-41
(Act. S.L.) 15-11-42
(O)Church, C. B. G. 23-8-41
(O)MacArthur, W. J. C. 27-8-41
Wallace, J. D. 30-8-41
(O)Joncas, H. J. F. 30-8-41
(O)Irwin, J. K. L. 30-8-41
Temple, G. D. 30-8-41
Young, M. K. 1-9-41
Whillans, M. G. 2-9-41
North, H. W. C. 2-9-41
(O)Black, G. A. 4-9-41
Cohen, E. 5-9-41
(O)Gates R. T. 6-9-41
Navin, S. J. 11-9-41
Townsend, M. L. G. 13-9-41
Boyd, W. J. 13-9-41
McIntyre, H. R. 13-9-41
Pashby, T. J. 20-9-41
Daniel, E. 20-9-41
Bruser, D. M. 23-9-41
Belton, J. H. 1-10-41
Birrell, J. D. 1-10-41
Brien, W. P. 1-10-41
Brown, C. B. 1-10-41
Crossland, A. M. 1-10-41
Emmett, J. C. 1-10-41
(O)Green, P. T. 1-10-41
Hall, W. E. 1-10-41
Kerr, W. K. 1-10-41
Kerwin, A. J. 1-10-41
Kester, H. A. 1-10-41
MacLeod, F. H. 1-10-41
McIntyre, D. N. C. 1-10-41
McPhail. J. E. B. 1-10-41
Morrow, B. M. 1-10-41
(O)O'Neill, J. C. 1-10-41
Patterson, F. P. 1-10-41
(O)Ristein, C. B. 1-10-41
(O)Sheard, C. 1-10-41
Sims, H. A. 1-10-41
Stewart, J. T. R. 1-10-41
Taylor, C. W. 1-10-41
Webb, E. 1-10-41
Weddell, J. A. 1-10-41
(O)Currier, T. E. 1-10-41
Lund, P. C. 1-10-41
Pepper, W. V. 1-10-41
Wilson, D. R. 1-10-41
Button, F. J. 1-10-41
Harris, R. S. 1-10-41
Holmes, S. J. 1-10-41
Firth, J. D. A. 1-10-41
Lindsey, G. W. 1-10-41
Ogryzlo, M. A. 4-10-41
Sturgeon, L. W. C. 4-10-41
Wilson, W. J. 4-10-41
Macaulay, M. G. 4-10-41
McLean, P. M. 7-10-41
Christie, H. R. 11-10-41
Teviotdale, J. R. J. 16-10-41
Baillie, J. H. 18-10-41
Warwick, O. H. 22-10-41
Theoret, J. R. 22-10-41
Goluboff, N. 23-10-41
Graham, R. T. G. 23-10-41
Laws, H. W. 23-10-41
McDonald, D. W. 30-10-41
McIllister, J. E. 30-10-41
Adams, J. W. 1-11-41
Braiden, R. S. 1-11-41
Elliot, A. J. 5-11-41
Donohue, W. L. 6-11-41
(O×)Campbell, I. 8-11-41
Hoffman, O. 8-11-41
McClintock, H. T. 8-11-41
McKay, W. G. 8-11-41
Penney, G. R. 8-11-41
Livesey, G. L. 8-11-41
Mahoney, J. A. 8-11-41
(Act S.L.) 1-7-42
Ryberg, P. E. 11-11-41
McGregor, H. B. 15-11-41
Ryall, D. B. 8-12-41
Watters, W. N. 8-12-41
White, J. T. 8-12-41
Boyle, E. S. 12-12-41
Sedlezky, I. 19-12-41
Hersey, M. L. R. 19-12-41
Sprague, G. H. 19-12-41
Vezina, J. R. A. 25-12-41
Barry, J. J. 25-12-41
Harvie, F. H. 26-12-41
(O)Armit, J. C. 1-1-42
Newstone, J. M. 1-1-42
Stewart, O. J. 6-1-42
Minnes, J. F. 8-1-42
(Act. S.L.) 1-10-42
Emery, G. H. 9-1-42
Wilson, C. G. 9-1-42
Bicum, G. 10-1-42
Brown, B. R. 10-1-42
Cowie, G. A. 10-1-42
Freed, B. D. 10-1-42
Jeffs, J. I. 10-1-42
Milne, D. H. 10-1-42
Setterington, M. J. 10-1-42
Dick, R. N. 10-1-42
(O)Lindsay, E. J. A. 10-1-42
Orr, W. L. 17-1-42
Kelly, H. G. 20-1-42
West, W. T. 20-1-42
Knowling. T. A. 24-1-42
Gordon, N. S. 27-1-42

Flight Lieutenants—*Continued*

Bellan, S. 27-1-42
Moore, A. H. 31-1-42
Gibson, J. E. 7-2-42
Ellenzweig, M. S. 31-1-42
(O)Kingsley, D. J. 1-2-42
(X)Paterson, A. 7-2-42
Francis, J. R. 11-2-42
McPhail, W. D. 13-2-42
Garand, N. D. 14-2-42
Kirschberg, L. S. S. 14-2-42
Parnell, J. L. 14-2-42
Robertson, R. 14-2-42
Magid, L. G. 15-2-42
Warner, H. M. 17-2-42
Cooper, H. G. P. 17-2-42
Jenkins, J. G. 21-2-42
Thompson, L. W. 21-2-42
Dufresne, J. M. A. 28-2-42
Allen, D. R. 28-2-42
Vanderburgh, A. W. 1-3-42
Rothwell, G. S. 1-3-42
Belanger, L. F. 12-3-42
Preston, F. C. 12-3-42
Bochner, A. A. K. 15-3-42
Gibson, W. C. 22-3-42
Jones, A. F. 29-3-42
Amodeo, W. 2-4-42
Ormsby, H. L. 2-4-42
Stephens, O. E. A. 2-4-42
Hutchison, J. H. 5-4-42
Wilson, J. W. 5-4-42
Thompson, J. L. 5-4-42
Wimpory, M. F. 5-4-42
Katz, E. 9-4-42
St. Onge, L. C. A. 9-4-42
Gibson, L. M. 12-4-42
Brown, N. M. 13-4-42
Meyer, E. G. 15-4-42
Aeberli, E. W. 16-4-42
Alexander, W. 21-4-42
Werthenbach, F. 21-4-42
Cantor, H. 26-4-42
Hughes, H. V. 30-4-42
Hutchison, G. A. 1-5-42
Carr, S. F. 1-5-42
Cameron, W. J. M. 2-5-42
Jarrott, J. R. 2-5-42
Hamilton, R. H. 2-5-42
Cowan, R. J. 6-5-42
McKone, B. 6-5-42
Thompson, T. A. M. 9-5-42
Atkinson, W. H. 20-5-42
Guest, W. C. 20-5-42
Black, T. H. 1-6-42
Todd, J. E. 1-6-42
Young, J. H. 1-6-42
Mills, W. C. B. 2-6-42
Webster, W. G. 2-6-42
Jeffery, E. S. 2-6-42
Latour, J. J. P. A. 2-6-42
Murray, J. L. 2-6-42
Harris, G. A. 2-6-42
Belanger, J. C. 2-6-42
Smith, C. H. 2-6-42
Moffat, D. J. 2-6-42
Evans, E. C. 2-6-42
Goldstein, P. 10-6-42
Murnaghan, D. P. 12-6-42
Pequegnat, H. M. 13-6-42
McCreary, J. F. 16-6-42
Roy, J. O. T. 16-6-42
Riven, D. J. 17-6-42
Rochman, S. 17-6-42
Hirt, H. 19-6-42
Leibel, B. 19-6-42
Stewart, F. H. 20-6-42
Wilson, W. R. S. 23-6-42
Heath, A. W. 30-6-42
Dunham, H. S. 20-6-42
Finley, J. C. 1-7-42
Elliott, G. R. F. 1-7-42
Hutchinson, W. E. 1-7-42
Baker, C. O. 2-7-42
Forrester, J. H. 3-7-42
Girvan, G. R. 13-7-42
Webster, J. A. 20-7-42
Wicks, C. A. 23-7-42
Donaldson, G. D. 30-7-42
Jones, D. R. 1-8-42
Miller, J. H. 1-8-42
Nash, R. D. 1-8-42
Pace, W. E. 1-8-42
Ritchie, D. C. 1-8-42
Macdonald, D. K. DeB. 1-8-42
Talmey, R. C. 1-8-42
Thomson, J. A. 1-8-42
Newson, D. A. 1-8-42
Harvey, G. L. 1-8-42
Wallace, G. M. 1-8-42
Wiegand, W. J. 1-8-42
Burnap, R. W. 10-8-42
Pilkey, R. M. 1-8-42
Lunan, M. D. 1-8-42
Caswell, L. A. 2-8-42
Brewster, J. M. 4-8-42
Burns, J. L. 4-8-42
Cowan, W. C. 4-8-42
Demary, R. F. F. 4-8-42
Denne, A. J. 4-8-42
Greco, E. J. M. 4-8-42
Healy, C. J. 4-8-42
Hill, J. E. 4-8-42
Howe, W. D. 4-8-42
MacKay, B. K. 4-8-42
Mahood, A. W. 4-8-42
Millar, O. B. 4-8-42
Moran, D. B. 4-8-42
Perry, V. R. 4-8-42
Purdon, A. L. 4-8-42
Flay, W. J. 6-8-42
Beckstead, J. L. 11-8-42
Earle, M. R. 11-8-42
Marchant, P. 15-8-42
Garrison, T. W. 15-8-42
Carson, G. T. 17-8-42
Warmington, R. G. 18-8-42
Bayne, J. R. 18-8-42
Hebert, A. 1-9-42
Beacock, G. C. 1-9-42
Blahey, P. R. 1-9-42
Bryson, B. F. 1-9-42
Connolly, B. M. 1-9-42
Cook, J. B. 1-9-42
Dalrymple, S. J. V. 1-9-42
Dobson, H. L. 1-9-42
Durkin, T. J. 1-9-42
Gourlay, W. N. 1-9-42
Guyatt, B. F. 1-9-42
McInnis, F. P. 1-9-42
McVicker, D. C. 1-9-42
Morton, G. M. 1-9-42
Northover, R. J. 1-9-42
Palmer, R. B. 1-9-42
Ross, J. A. 1-9-42
Sharpe, W. D. 1-9-42
Smith, N. S. H. 1-9-42
Stewart, J. D. 1-9-42
Varty, H. H. 1-9-42
Caldwell, L. A. 1-9-42
Sparling, J. F. 1-9-42
Gibbon, A. D. 1-9-42
Croll, D. D. 4-10-42
MacKay, E. N. 4-10-42
Farmer, A. W. 5-10-42
(Act. S.L.) 5-10-42
Anderson, R. M. 6-10-42
Bradley, J. E. 6-10-42
Donaldson, M. B. 6-10-42
Gravel, J. J. A. 6-10-42
Harbert, R. G. M. 6-10-42
Hurst, H. G. 6-10-42
LaRochelle, J. L. E. 6-10-42
McDonald, W. A. L. 6-10-42
McKenna, R. D. 6-10-42
Russell, W. K. F. 6-10-42
Voelker, P. A. 6-10-42
Wylie, H. L. 6-10-42
MacKenzie, J. G. 6-10-42
Rankine, J. A. 6-10-42
Scott, J. A. 13-10-42
Baldwin, J. H. 13-10-42
Caldwell, J. D. 14-10-42
Wardill, T. E. M. 18-10-42
McElman, G. W. 20-10-42
Park, N. S. 20-10-42
Reid, J. F. 27-10-42
Savage, H. G. 1-11-42
Ramsay, R. M. 1-11-42
Becher, J. C. 3-11-42
Berube, J. R. F. 3-11-42
Bell, G. I. 3-11-42
Blades, T. R. 3-11-42
Brown, N. L. 3-11-42
Carlen, S. A. 3-11-42
Dunne, M. W. F. R. 3-11-42
Fisher, E. A. J. 3-11-42
Garrett, D. A. 3-11-42
Grant, D. R. 3-11-42
Joliffe, R. F. 3-11-42
Jones, E. A. 3-11-42
Robertson, F. G. 3-11-42
Rose, J. E. 3-11-42
Shapiro, L. 3-11-42
Thompson, G. A. 3-11-42
Trotter, G. K. 3-11-42
Woodhouse, D. H. 3-11-42
Wrathall, E. L. 3-11-42
Roger, J. D. 3-11-42
McKeown, J. 4-11-42
Burke, C. L. 7-11-42
Whyte, D. W. 7-11-42

Flying Officers

(O)Thorne, E. L. 26-5-41
(Act. F.L.) 1-6-42
Charbonneau, J. A. R. 28-11-41
(Act. F.L.) 15-7-42
Norris, C. K. 13-1-42
Turgeon, J. R. G. 13-4-42
(Act. F.L.) 13-4-42
Woywitka, N. W. 5-5-42
Ewart, D. M. 18-5-42
Lloyd, Smith, D. L. 1-6-42
Caldwell, J. W. G. 15-6-42
(Act. F.L.) 15-6-42
MacVicar, A. A. 22-6-42
Nicholls, G. B. 1-7-42
Annear, W. C. 6-7-42
Blackwood, J. R. 6-7-42
Fraser, J. S. G. 6-7-42
Joron, G. E. 6-7-42
MacLean, J. G. 6-7-42
Stapleton, J. H. 6-7-42
Watkins, R. T. 6-7-42
Wener, J. 6-7-42
Seaman, K. 6-7-42
Hopper, S. A. 11-7-42
Duncan, R. B. 13-7-42
Nonamaker, E. P. 13-7-42
Angus, J. R. J. 13-7-42
Crawford, J. S. 17-7-42
Crosby, A. B. 28-7-42
Fownes, J. A. 1-8-42
Brown, E. R. G. 3-8-42
Bruce, J. D. C. 3-8-42
Cantelope, D. C. P. 3-8-42
Gagnon, J. F. O. 3-8-42
Gratton, J. C. A. B. 3-8-42
Jackson, J. R. 3-8-42

Flying Officers—*Continued*

Leduc, A. D. G.	3-8-42
Mugan, J. F. M.	3-8-42
Robinson, D. A.	3-8-42
Simth, R. B.	3-8-42
Gendron, J. L. R.	3-8-42
Francis, R. R.	7-8-42
Hunt, J. W.	28-8-42
Anderson, J. O.	31-8-42
(Act. F.L.)	31-8-42
Darche, J. J. H. E.	31-8-42
(Act. F.L.)	31-8-42
Finlayson, A. J.	31-8-42
(Act. F.L.)	31-0-42
Hilton, J. H. B.	31-8-42
(Act. F.L.)	31-8-42
MacIntosh, O. C.	31-8-42
(Act. F.L.)	31-8-42
MacLean, C. R.	31-8-42
(Act. F.L.)	31-8-42
McCracken, J. G.	31-8-42
(Act. F.L.)	31-8-42
McEwen, B. B.	31-8-42
(Act. F.L.)	31-8-42
Moffat, M. H.	31-8-42
(Act. F.L.)	31-8-42
Morris, M. L.	31-8-42
(Act. F.L.)	31-8-42
Morrison, C. G. R.	31-8-42
(Act. F.L.)	31-8-42
Nolan, W. J.	31-8-42
(Act. F.L.)	31-8-42
Smith, W. D.	31-8-42
(Act. F.L.)	31-8-42
Stephens, G. M.	31-8-42
(Act. F.L.)	31-8-42
Stewart, D. B.	31-8-42
Stewart, W. G.	31-8-42
(Act. F.L.)	31-8-42
Symington, K. D.	31-8-42
(Act. F.L.)	31-8-42
Williamson, N. L.	31-8-42
Bright, H. J.	31-8-42
Carruthers, E. P.	31-8-42
Jamieson, J. S.	31-8-42
Fraser, H. A.	31-8-42
McCulloch, J. C.	4-9-42
(Act. F.L.)	4-9-42
McEachern, C. G.	15-9-42
(Act. F.L.)	15-9-42
McAskile, K.	18-9-42
(Act. F.L.)	18-9-42
Albertson, D. B.	25-9-42
Snider, E. P.	2-10-42
(Act. F.L.)	5-10-42
Bateman, G. L.	5-10-42
Gignac, J. E. F.	5-10-42
Lumsden, W. F.	5-10-42
MacGougan, M. K.	5-10-42
(Act. F.L.)	5-10-42
Babb, J. W.	1-11-42
Beaubien, L. F. J. D. T.	9-11-42
Horner, C. M.	9-11-42
(Act. F.L.O.)	9-11-42
Ord, J. V. R.	16-11-42
Thompson, J. W. R.	27-11-42
Smith, F. H.	17-12-42

Courses in Industrial Medical Work

There is need for information as to what physicians in general practice, and not eligible for military duties, are interested in part time service for the supervision of the health of industrial workers. An increasing number of employers realize the importance of maintaining and improving the general level of health, especially at present. Since most factories are small, they must employ part time medical services.

The physicians require to spend at the rate of about one hour per week, per hundred workers in these factories. The procedures to be adopted are the subject of short refresher courses from time to time. One of these will be presented by the University of Toronto about the middle of February by arrangement with the Committee on Industrial Medicine of the Ontario Medical Association.

Any physicians interested are invited to communicate with Dr. J. G. Cunningham, Director, Industrial Survey, the Canadian Procurement and Assignment Board, 19 Central Chambers, Ottawa.

Your attention is directed to a statement on the objective, scope and methods in industrial medical work prepared by the Committee of the Canadian Medical Association on this subject and published in the September, 1942, issue of the *Journal* [p. 24, *Supplement*].

The results of the census taken in Canada in June last year have now been published and show that the total population of the Dominion was then 11,419,896, as compared with 10,376,786 in 1931. The gain of 1,043,110 is about two-thirds of that which was expected. in 1901 the population of Canada was 5,371,315, and the increases at the next three censuses were respectively 1,853,328, 1,581,306 and 1,588,837.

Abstracts from Current Literature

Medicine

Physical Treatment of Acute War Neuroses. Sargant, W.: *Brit. M. J.*, 1942, Nov. 14, 574.

During war many individuals are exposed to stress to which they would never have been subjected in normal times. After dealing with a large number of cases who broke down under abnormal stress the author says his most important finding has been the supreme need for immediate first aid treatment of the acute neurosis occurring in a good previous personality. This is best done by physical methods applied during the first hours rather than after days or weeks. For the acute panic state heavy sedation should be given at the earliest possible moment. As a rule too little rather than too much is given. If unconsciousness lasting some hours is produced it may stop the development of a neurosis requiring treatment in hospital. Breakdown can also be prevented by judicious use of prophylactic sedation. Courage and will-power have physical components and are certainly not directly dependent on the psyche.

The author advises the following doses in first-aid: paraldehyde 2 to 4 drams, sodium amytal 6 to 9 grains or medinal 10 to 20 grains. Neuroses which have been allowed to become established need treatment in hospital by psychiatrists using continuous sleep treatment, modified insulin treatment or convulsion therapy.

J. R. LACROIX

Arteriosclerosis with Diabetes Mellitus. Lisa, J. R., Magiday, M., Gallerway, I. and Hart, J. F., *J. Am. M. Ass.*, 1942, **120**: 192.

The results of this investigation differ from those that have previously been reported by other authors. They reveal that arteriosclerosis is more common in diabetic than in non-diabetic persons. Arteriosclerosis is more

frequently severe in diabetic than non-diabetic persons and severe arteriosclerosis is more frequent among persons with diabetes, at all ages.

Sclerotic changes in both the diabetic and the non-diabetic person increase in frequency as age advances, but among persons with diabetes a given frequency of these changes is reached about 10 years earlier than among those without the disease.

Occlusive accidents in the coronary arteries occur with greater frequency among diabetic than among non-diabetic patients of all ages, but the frequency of such accidents is not correlated with age.

Arteriosclerosis of the kidneys compatible with chronic hypertension is more frequent among diabetic patients. Peripheral arteriolar sclerosis necessitating amputation is of equal severity in persons with and without diabetes. It has no close relationship to visceral arteriosclerosis, but the severe visceral changes are much more frequent in diabetic persons.

S. R. TOWNSEND

Mebaral in Treatment of Epilepsy. Cohen, B. and Myerson, A.: *N. E. J. Med.*, 1942, **227**: 336.

Mebaral was first used in Europe under the name of prominal (n-methyl-ethyl-phenyl barbituric acid). It is considered by the authors to be the best drug for use in agitated depressed and anxiety states because they feel it produces more tranquillity and less narcosis than any other drug. Toxic symptoms are absent when the daily dosage does not exceed six to nine grains. Because of the lack of taste mebaral is particularly useful for administration to epileptic children and adult psychotic epileptics, where it may be an advantage to conceal the drug in food. In certain cases that showed poor results with phenobarbital, phenytoin and bromides, separately or in combination, much improvement was noted with the substitution of mebaral, and the latter drug was found to be less toxic than either phenytoin or phenobarbital.

The authors consider mebaral to be the drug of first choice in the treatment of both grand and petit mal. In cases in which it does not work well by itself it may be combined with phenytoin.

NORMAN S. SKINNER

Surgery

New Methods for Determining the Viability of Bowel: Preliminary Report with Clinical Cases. Herrlin, J. O. *et al.*: *Arch. Surg.*, 1942, **45**: 785.

The establishment of the viability of the bowel in patients with strangulated hernia is of great importance in abdominal surgical procedures at the time of operation, since resection of the bowel considerably increases the operative hazard.

Since the decision concerning the viability of the intestine must be made within a short time after the abdomen is opened, the surgeon often finds himself in a quandary as to whether or not the intestine is beyond recovery.

To determine immediately whether the circulation in the bowel will be re-established after strangulation is released three possibilities presented themselves:—(1) The use of fluorescein (2) the local use of procain hydrochloride, and (3) the inhalation of pure oxygen.

The authors describe a method in which fluorescein is used whereby direct visual evidence concerning the viability of an injured portion of the intestine can be established immediately. Procaine hydrochloride injected along the vessels leading to a strangulated loop of intestine is able to release vascular and muscular spasm, thereby restoring the viability of the intestine. It serves not only as a diagnostic agent but also as a therapeutic measure. The time of strangulation is the most essential factor for the return of circulation in the bowel thus damaged.

G. E. LEARMONTH

Keloids. Garb, J. and Stone, M. J.: *Am. J. Surg.*, 1942, **58**: 375.

Keloids, cheloids, or cancroids, are benign proliferative fibrous tissue overgrowths having their origin in the subpapillary plexus of the cutis and developing as a result of trauma. They are hard, raised, shiny, usually smooth, hairless growths, often covered by telangiectatic capillaries. They may be single or multiple, usually situated in longitudinal folds of the skin and may be painful, tender, or itchy. Keloids have a tendency to recur irrespective of the method used in their removal.

It is accepted that even spontaneous keloids are caused by an injury. They occur at all ages but are most common in the young, and rare in the aged. Negroes, Hindus and Malayans are said to be more likely to develop keloid than whites. The opinion that syphilis and tuberculosis are etiological factors is not supported. The growths have a predilection for the sternum, back of the chest and lobes of the ears. Various theories are discussed. It is not accepted that keloids are tuberculous, related to slow elimination of necrotic material, or cancerous dermatoses. But that the activity of the glands of internal secretion is related to keloid growth is substantiated by the age incidence and case histories.

The differential diagnosis of keloid from other raised nodular growths includes the consideration of hypertrophied scars, sarcoids, scleroderma, fibroma and paraffinomas.

Treatment depends on roentgen therapy. This may follow surgical excision, but removal by any means is usually futile without irradiation at the first sign of recurrence. But if keloids are then treated regularly, the response to small doses of x-rays is good. Internal

medication and topical applications are useless. It was found that various physiotherapeutic methods were similarly without benefit. Excision by scalpel must be through healthy tissue. Rigid asepsis and scarlet red ointment promoted more rapid healing. Roentgen therapy dosage is discussed.

The prevention of keloid growths in those susceptible is the prevention of trauma to the skin such as sunburn, tight belts, acne, furunculosis, herpes zoster and other lesions that might lead to keloid formation.

BURNS PLEWES

The Abdominal Surgery of "Total War". Gordon-Taylor, G.: *Brit. J. Surg.*, 1942, **118**: 89.

This is a long review of abdominal injuries as they are being seen in this war both among men in the armed forces and among bombed civilians. Some of the interesting points and important conclusions of the article follow.

Abdominal cases requiring surgical aid are infrequent under the conditions of modern warfare. Prognosis is best in young adults, worst in young children. Youngest recorded life destroyed by bombs in Britain has been a 6 cm. fetus killed in utero by blast. Blast alone, with no projectile involved, has ruptured the abdominal wall in some cases. In the majority of cases a fragment of bomb casing has acted as the projectile. Bullets, splintered glass, stones and earth are the other more common projectiles.

There is a remarkable variation in the general condition of different cases of abdominal wounds. Hæmorrhage is the predominant cause of death in the early hours. Secondary hæmorrhage has been an infrequent phenomenon.

Over 20% of abdominal injuries result from wounds of the buttock. Minute, penetrating wounds are dangerous and easily overlooked. The larger the wound of the abdominal wall the worse is the prognosis. Vertical wound-tracks and those from side to side through the abdomen have a worse prognosis than anteroposterior wounds. The presence of other wounds elsewhere makes prognosis worse. The most fatal associated injury is a smashed femur, especially in its upper part.

Suture of the bowel carries a lower mortality than resection and should be preferred whenever possible. Acute dilatation of the stomach has occurred with impressive frequency. Injuries of the duodenum carry a high mortality. Surgical intervention should not be directed toward the liver without very clear indications. Injuries of the spleen have been relatively frequent. Renal injuries should be treated expectantly unless the surgeon's hand is forced. A "second operation" is most often fatal.

Blast can cause lacerations of bowel without marking the abdominal wall. Sub-parietal injuries have been common from both blast and crush. Immersion-blast has been an important cause of sub-parietal abdominal injuries. In the upper abdomen left-sided wounds have a more grave outlook because of the presence of the stomach and splenic flexure.

Approximately 50% of patients with abdominal injuries for whom operation is possible survive. There is some improvement in recovery rates over 1914-18 but the difference is not remarkable. Few lengthy resections of bowel have survived. Sulfonamides locally and orally have proved of great value. Blood transfusions have had liberal use and without them many more would have perished.

The abdominal surgery of "total-war" is well worth while.

J. R. LACROIX

Unusual Viscera in Indirect Inguinal Herniæ. "Présence inusitée d'un viscère dans une hernie inguinale oblique externe." McMillan, W. M.: *Ann. Surg.*, 1942, **116**: 266.

La présence d'un ovaire dans le sac d'une hernie inguinale n'est pas courante, néanmoins des chirurgiens expérimentés l'ont constatée au moins une fois dans leur carrière. Mais la présence d'un utérus dans une hernie inguinale oblique externe est plus rare. L'auteur présente deux cas et se propose ainsi d'attirer l'attention sur une complication éventuelle d'un accident aussi fréquent que la hernie inguinale.

Le premier cas est celui d'une danseuse acrobatique de 30 ans, mariée, n'ayant jamais été menstruée, dont les antécédents héréditaires et familiaux marquent une tendance accusée à la hernie et ayant subi elle-même à l'âge de six ans une opération pour hernie inguinale gauche. L'exploration a révélé la présence dans le sac excisé d'un utérus rudimentaire ayant subi une légère dégénérescence kystique de son fond.

Le second cas est celui d'une femme de 29 ans, n'ayant jamais été menstruée et accusant des douleurs à l'aine depuis l'âge de 2 ans. Un examen gynécologique antérieur, deux ans auparavant, avait révélé que l'utérus était introuvable. A l'ouverture du sac l'utérus fut découvert couché à mi-chemin dans le canal inguinal. Il est évident que de telles conditions peuvent donner lieu à des diagnostics imprécis ou incomplets. Il est donc bon de les considérer à l'occasion.

PIERRE SMITH

Obstetrics and Gynæcology

Does the Antenatal Use of Vitamin K Prevent Hæmorrhage in the Newborn Infant? Parks, J. and Sweet, L. K.: *Am. J. Obst. & Gyn.*, 1942, **44**: 432.

A single dose of 5 mgm. of vitamin K was given by mouth on admission to the mothers of 1,151 infants; infants of 1,594 mothers who received no vitamin K acted as controls. These mothers represent the lowest income group of a metropolitan area. There was no appreciable ill effect of the vitamin on the mothers. As it was done in this study, the administration of

vitamin K to mothers had no evident effect in reducing the incidence of neonatal hæmorrhage. The vitamin K used was effective in raising the blood prothrombin levels of both the mother and infant. If an elevated blood prothrombin level is a significant factor in preventing neonatal hæmorrhage, the authors are unable to explain the results of their clinical survey. Additional clinical and laboratory studies involving large groups of patients should clarify this question.

ROSS MITCHELL

Detailed Technique of a Modified Local Anæsthesia for Cæsarean Section. Beck, A. C.: *Am. J. Obst. & Gyn.*, 1942, **44**: 558.

Three different solutions are used. Solution 1 consists of 50 c.c. of 0.5% procaine without adrenalin for intradermal and subcutaneous infiltration. In the second solution, 1 c.c. of 1/1,000 adrenalin is added to 200 c.c. of 1% procaine. This is used only for the deep nerve-blocking injections which are made in the vicinity of the semilunar lines at the outer border of the recti muscles. Solution 3 is made up of 50 c.c. of 0.5% procaine to which 0.25 c.c. of 1/1,000 adrenalin is added. It is used to infiltrate the peritoneum on each side of the bladder and over the lower part of the uterus. According to the majority of writers not more than 1 to 1.5 grm. of procaine and 15 min. of adrenalin should be used. Satisfactory anæsthesia can be obtained within the recommended limits.

The chief advantage of local anæsthesia lies in the fact that its use is accompanied by little or no immediate risk of death. Many men select this type of anæsthesia in cases of toxæmia, respiratory infection, diabetes, heart and kidney disease. The contraction and retraction of the uterus is not interfered with, as it is when general anæsthesia is used. Fluids can be taken by mouth before, during, and immediately after operation. Vomiting during and after operation does not occur unless excessive amounts of the drugs are given. Foods are ingested within a few hours after the patient returns to her room. Bronchial secretion is not increased. The risk of thrombosis and embolism is diminished. The child is not affected by either the analgesic drugs or the anæsthetic agents. As a result the child cries spontaneously as soon as it is taken from the uterus.

The only disadvantages are that it is time-consuming, requires gentle handling of the tissues, and tries the patience of the operator.

ROSS MITCHELL

Cæsarean Section under Spinal Analgesia. Thomas, R. C.: *J. Obst. & Gyn. of the Brit. Emp.*, 1942, **49**: 247.

A series of 121 Cæsarean sections performed under spinal anæsthesia is presented, together with tables showing the indication for section, the type of spinal anæsthetic used, the type of section performed, and other relevant details.

Recent literature is discussed, with special reference to the advantages and dangers, indications for and contraindications to the use of spinal anæsthesia in advanced pregnancy. The views of various authorities as to the special susceptibility of pregnant women to the cocaine group of drugs are given. Reference is made to the multiplicity of drugs used for inducing analgesia by the spinal route, some being related to the cocaine group, others not so related.

The technique of administration, and dosage in individual cases of heavy percaine (Ciba) are given, and attention is drawn to the simplicity of technique in the injection of this solution into the spinal canal, and the resultant minimal disturbance of the patient. Premedication is discussed, with special reference to the necessity to combat the fall in blood-pressure often associated with spinal anæsthesia. Heavy percaine, hyperbaric solution, 1:200, with 6% glucose, was used in all the author's cases except three, with no maternal mortality referable to the anæsthetic. He considers it to be a safe and suitable drug for use in spinal anæsthesia in selected cases of advanced pregnancy. It has given eminently satisfactory results as used in the Croydon County Borough Obstetric Service. It is suggested that it is worthy of an extended trial by other obstetricians, and until this has been made, spinal anæsthesia should not be condemned.

So far as Thomas is aware, this is the only series of Cæsarean sections performed under heavy percaine which has been published. He, therefore, is unable to compare his results with those of other obstetricians using the same solution and technique.

P. J. KEARNS

Some Factors in Prognosis in Carcinoma of the Cervix. Gemmell, A. A.: *J. Obst. & Gyn. of the Brit. Emp.*, 1942, **49**: 453.

The results achieved in the treatment of 151 cases of carcinoma of the cervix between 1929 and 1937 are recorded. Various factors in prognosis are considered and an attempt made to assess their value. The stage of the growth (League of Nations' classification) is a valuable index to prognosis.

The more serious appearances in the bladder are found in association with the more extensive stages of the disease. The survival rates of patients with transverse ridging or œdema is roughly half of patients with no changes in the bladder or only minor changes. Sigmoidoscopy has given information in Stages III or IV cases only. The changes noted by sigmoidoscopy were few and, possibly, digital rectal examination would have given information similar to that obtained by using a sigmoidoscope. Approach of the growth towards the rectum is of serious prognostic import and affords some information as to the expectation of life.

Variation of the dosage of radium within fairly wide limits does not affect the prognosis. Histological classification of growths, from material obtained by biopsy, is of no assistance in determining prognosis. Patients who have a low value for colloidal vanadate reaction before treatment have a significantly lower survival rate than those in whom the value is in the normal zone. The age of the patient at the time of treatment is not a guide to prognosis, nor is the number of children or pregnancies. Duration of symptoms prior to treatment. Contrary to expectation this observation was no guide to prognosis in this series of cases. Coitus after treatment. Attention is drawn to this factor, but the available evidence is too small to form any conclusion. Stump carcinoma. The prognosis in true stump carcinoma is approximately the same as when the whole uterus is intact.

P. J. KEARNS

Pædiatrics

Posture Habits in Infancy Affecting Foot and Leg Alignments. Thelander, H. E. and Fitzhugh, M. L.: *J. Pæd.*, 1942, **21**: 306.

The authors emphasize the importance of the prewalking period in developing posture habits. They studied 246 consecutive children attending a health centre, the age of the majority being between 18 months and 3 years. The largest group showing deviation were knee-chest sleepers. One-third of these toed in and two-thirds toed out. The prone sleeping position is favoured by many babies and mothers as the sleeper is less apt to kick off covers. This position is often persisted in for many months with the feet turned in or out and the knees spread apart. Other factors which tend to alter the neutral position of alignment are bulky diapers, riding astride the mother's hips, canvas swings and walkers. Standing for a long time on soft padded surfaces, such as in the crib or pen, tends to evert the feet. Fortunately a high percentage of malalignments of infancy recover spontaneously. Preventive therapy is important, however. The infant should be trained to sleep on alternate sides from birth, this position being favoured by a tight roll to the back and small diapers. The mother should be instructed to correct lesser deviations by simple manipulations, practised many times a day during the first three months. If not corrected by this time, the child should have orthopædic attention before standing commences. When the child first begins to stand and walk, a small degree of intoeing acts as a factor of safety. Normally this is outgrown before he reaches three years, unless it is aggravated by a knee-chest sleeping position or by sitting on his inturned soles. Babies who simply sit or stand in bed or pen are more likely to show more malalignment of feet and legs than the active creeping, climbing babies. Stiff, hard-soled shoes also limit normal action of the foot.

S. J. USHER

Obesity in Children. Bronstein, I. P., Halpern, L. J. and Brown, A. W.: *J. Pæd.*, 1942, **21**: 485.

The prevalent assumption that obesity is usually an expression of some underlying endocrine dysfunction has led to the indiscriminate administration of various endocrine products. Recent work has emphasized the fallacy of such an assumption and the suggestion has been made that the term Fröhlich's syndrome to designate markedly overweight children, be deleted from the nomenclature. The authors made a thorough clinical and laboratory investigation over an average period of 2 years of 46 children of an average age of 11 years. The average weight of the entire group on admission was about 135 pounds, or 57% overweight. Not a single case of endocrine dysfunction could be found in this group. The bone development was normal and the tooth eruption was accelerated. Hypercholesteræmia was not found. Many of the children had excessive appetite. The general treatment consisted mainly of restricting the diet and fluid intake, exercise, and adding ample vitamins. A moderate loss of weight followed in most cases if the child adhered to this regimen, but the majority refused to co-operate. Oral administration of thyroid extract in large daily doses over fairly long intervals did not cause loss of weight in most instances. Chorionic gonadotropins or whole anterior pituitary extract given parenterally failed to influence the weight. Amphetamine sulphate (benzedrine), while immediately effective in causing a reduction of weight by depressing the appetite, lost its effect soon after the drug was stopped, and in some instances even while the drug was being taken.

From the above, no appreciable loss of weight was effected in this series, regardless of the type of treatment used. However, the authors emphasize that in their experience, obesity in mentally adequate children tends to correct itself at or about puberty. At this time they become aware of their obesity as a handicap and are then willing to co-operate in a dietary regimen.

S. J. USHER

Orthopædics

Immersion Foot. Webster, D. R., Woolhouse, F. M. and Johnston, J. L.: *J. Bone & Joint Surg.*, 1942, p. 785.

The authors discuss their investigation of 142 survivors having "immersion foot". These patients had been exposed to the waters of the Northern Atlantic with temperature of 34 to 36 degrees F. for variable periods from 30 hours to 22 days. When rescued the feet are usually waxy white, cold and swollen with heavy and

numb subjective sensations. After removal of shoes and socks, the feet rapidly became the seat of acute aseptic inflammation resulting from an intense vasodilatation. The degrees have been classified into four groups on the basis of visible pathological changes. The authors' contribution has been in the use of dry refrigeration to lower the tissue metabolism and diminish the vasodilatation. By this method the swelling and pain are greatly relieved and minimal tissue loss ensues. The refrigeration is associated with postural drainage by elevation and prophylaxis against sepsis. The results of treatment with suggestions are included.

This is a most valuable contribution to our clinical knowledge on a subject of great practical importance at this time.

H. F. MOSELEY

Anæsthesia

Continuous Caudal Anæsthesia During Labour and Delivery. Hingson, R. A. and Edwards, W. B.: *Curr. Res. in Anæs. & Anal.*, 1942, **21**: 301.

The authors have made use of caudal anæsthesia for obstetrics as employed by several American anæsthetists in time past but have greatly extended its applicability by introducing the factor of continuous administration of the anæsthetic drug into the sacral canal similar to the technique of continuous spinal anæsthesia. This affords an anæsthesia which is applicable to the most prolonged labour in contrast to that afforded by a single dose caudal injection, the duration of which is definitely limited. It has opened up new vistas in obstetrical anæsthesia which will bear thorough investigation in competent hands. The method is not without its dangers as the authors are careful to acknowledge but these can be avoided if proper precautions are observed.

Briefly, the technique consists of the introduction of a semiflexible, malleable, stainless steel, nineteen gauge caudal (B-D) needle into the sacral canal and then by means of a length of rubber tubing and a Luer-Lok continuous flow syringe, an initial dose of 30 c.c. of 1.5% metycaine in physiological saline is slowly injected into the sacral canal at an even rate over a two-minute period. The needle is strapped in place and subsequent injections of 20 c.c. of additional anæsthetic solution is injected every thirty to forty minutes. This affords a remarkably effective means of relieving much of the discomfort of labour and delivery. Some of the complications reported include four broken needles, difficulty in inserting the caudal needle, unilateral anæsthesia, minor systemic complaints, and backache. Means of avoiding these complications are described.

This article reports on sixty-five deliveries under the method, but at the time of going to press the authors report 250 cases handled in the same way which will be dealt with subsequently.

F. ARTHUR H. WILKINSON

Hygiene and Public Health

Studies on Methods of Prevention of Epidemic Influenza. Stokes, J. and Henle, W.: *J. Am. M. Ass.*, 1942, **120**: 16.

In this article three methods of controlling the spread of influenza are discussed: air sterilization; active immunization; passive immunization.

Air sterilization.—Experiments are recorded in which a large infant ward was used with mice as experimental animals. Highly virulent suspensions (allantoic fluid) of influenza A virus were atomized into the air. In one period propylene glycol vapour was utilized; in another period no agent at all was used, and in a third period ultraviolet light was tested. With propylene glycol vapour all of 70 mice survived, with ultraviolet light sterilization 67 or 70 mice survived, and with no treatment all of the 70 mice died. An observation is also recorded of respiratory infections in two infant wards each with 16 patients. In a preliminary period of 8 weeks the incidence of respiratory infection was equal in the two wards (15 cases in one and 16 in the other). In a succeeding period of 8 weeks one ward was treated with propylene glycol vapour while the other was untreated. In the propylene glycol treated ward respiratory infection fell to 2 cases of which one was doubtful, while in the untreated ward the incidence remained the same (16 cases).

Active immunization.—An experiment with 72 boys residing in the same building is cited. Forty-four of the boys were treated with formolized influenza virus and 28 were kept as controls. All boys were then permitted to inhale freshly isolated influenza A virus through a mask for four minutes. One of the immunized boys contracted influenza (3%), 10 of the controls (35%).

Passive immunization.—Animal experiments are quoted indicating a definite protection when animals are given immune serum prior to inoculation with influenza virus. No human experience is given.

FRANK G. PEDLEY

The Relation of Childhood Infection to the Development of Tuberculosis in Early Adult Life. Israel, H. L. and DeLien, H.: *Am. J. Pub. Health*, 1942, **32**: 1146.

The purpose of this study is to try and help answer the question as to whether tuberculosis developing in adult life, in the case of an individual who has been infected in childhood, is due to endogenous reinfection or to reinfection from without.

Nine hundred and eighty-two persons, known to have been tuberculin-positive in their childhood, have been followed into adolescence and maturity. The family contacts of these individuals have also been followed particularly as to whether they were sputum-positive or not. The following table gives the pertinent data:

	Coloured	*White*
Mean annual morbidity rate per 100 from clinical tuberculosis in those having no history of family contact with open tuberculosis.....	0.98	0.1
Mean annual morbidity rate per 100 from clinical tuberculosis in those having a history of family contact with open tuberculosis.....	3.62	2.0

Although the above analysis is based on 36 cases of clinically manifest tuberculosis the results are considered statistically significant and seem to indicate that continued exposure in adolescence to exogenous infection was probably the important factor in the disease rather than reinfection from an endogenous source.

FRANK G. PEDLEY

The Method of Nasopharyngeal Culture in the Diagnosis of Whooping Cough. Brooks, A. M., Bradford, W. L. and Berry, G. P.: *J. Am. M. Ass.*, 1942, **120**: 883.

The authors believe that cultures of *H. pertussis* can more frequently be secured by the use of the nasopharyngeal swab than by the cough plate method. A sterilized swab, made by wrapping a piece of cotton about the end of a flexible copper wire, is inserted into the nares and gently passed back until it touches the posterior nasopharyngeal wall. This is inoculated on a plate of Bordet medium and incubated for 72 hours at 35° C.

The following table gives the results of a large number of cultures:

TABLE I.

	Nasopharyngeal swab method		*Cough plate method*	
Week of disease	*Number of cultures*	*% positive*	*Number of cultures*	*% positive*
1st.....	60	80	31	45
2nd.....	124	69	75	48
3rd.....	91	64	39	46
4th.....	59	24	14	21
5th & later..	104	20	39	8
Total..	438	52	198	37

FRANK G. PEDLEY

Vitamins for the Prevention of Colds. Cowan, D. W., Diehl, H. S. and Baker, A. B.: *J. Am. M. Ass.*, 1942, **120**: 1268.

The authors state, "it has not been shown by adequately controlled experiments that the addition of any of the vitamins to a reasonably adequate diet produces increased resistance to infections of the upper respiratory tract, the millions of dollars' worth of vitamin preparations which are sold each year for this alleged purpose notwithstanding".

At the beginning of the school year 1939-1940 427 students of the University of Minnesota were enrolled in a "cold prevention" group. One hundred and eighty-three of these were given 100 milligram tablets of synthetic ascorbic acid and instructed to take 2 tablets daily for 28 weeks. Fifty other students were told to take 2 tablets daily for 2 weeks, then 1 tablet daily until a cold developed when 5 tablets were to be taken during the first two days of the cold after which they were to revert to the 1 tablet daily dose. One hundred and ninety-four students were supplied with placebo tablets of the same appearance and taste as the ascorbic acid tablets. The students receiving the vitamin tablets experienced 1.9 colds during the period of 28 weeks; the control group had 2.2 colds per student. The vitamin group had recorded an average of 5.5 colds per person per season and the control group had recorded an average of 5.9 colds per person per season in previous years.

During the school year 1940-1941, 347 students were enrolled in a "cold prevention" group. Only 264 however co-operated throughout the study. Of these 264 170 were given a multiple vitamin tablet containing vitamin A, thiamine chloride, riboflavin, ascorbic acid and vitamin D. Some also got nicotinic acid. A control group of 94 students were given placebo capsules which were indistinguishable from the vitamin capsules. There was no significant difference in the number of colds reported by the experimental and control groups. The average duration of the colds was the same in the two groups.

FRANK G. PEDLEY

A good story, anent the neglect of the study of the History of Medicine, is told by Harvey Cushing. At an annual meeting of the American Medical Association he, and E. C. Streeter, requisitioned a stall and made an exhibit of books and incunabula associated with Vesalius, the Father of modern anatomy and, one might almost say, the Messiah of the renaissance of medicine. It was alongside of the other stalls exhibiting surgical instruments, baby foods, drugs, and so forth. Over it was written, in large letters, "Vesalian Exhibit." It was on view some time before a solitary doctor arrived, laden with his collections from other stalls. He only stopped long enough to inquire: "Say, are there any samples given away?" "Samples of what," he was asked. "Why, of what you've got here—Vaseline, of course." —The Present Need for the Study of the History of Medicine, StClair Thompson, *Proc. of Roy. Soc. of Med.*, October, 1933.

Hans Sloane on his arrival in London waited upon Sydenham, with a letter of recommendation from a friend setting forth his qualifications in flaming terms—"He was a ripe scholar—a good botanist—a skilful anatomist". After Sydenham had perused this eulogy, and had eyed the tyro very attentively, he said, "All this is mighty fine! but it won't do. Anatomy—botany—nonsense! Sir, I know an old woman in Covent Garden who understands botany better; and as for anatomy, my butcher can dissect a joint full as well: No, young man, all this is stuff; you must go to the bed-side; it is there you can alone learn disease."

Obituaries

Colonel the Honourable Murray MacLaren, C.M.G., LL.D., B.A., M.D.C.M., M.R.C.S., F.R.C.S., F.A.C.S., Knight of Grace of the Order of St. John of Jerusalem and Commander of the Order of Avis, Portugal, died at his home in Saint John on Christmas Eve, 1942, at the age of 82.

Dr. MacLaren was born in Richibucto, on April 30, 1861, the son of Dr. Laurence and Jane MacLaren. He was educated in the old Grammar School at Saint John, University of New Brunswick, University of Edinburgh, and did postgraduate work in London and Vienna. For many years, he served on the surgical staff of the Saint John General Hospital.

Dr. MacLaren was the father and founder of R.C.A.M.C., organized in New Brunswick, for he recruited and commanded No. 8 Stretcher Bearer Company and No. 8 Ambulance in 1900. Previous to this, he had served as assistant surgeon to various militia formations. He was a past president of the Canadian Medical Association and was active in the Red Cross, St. John Ambulance and Boy Scout Associations.

Dr. MacLaren was elected to the House of Commons in 1921, 1925, 1926, and 1930. He was Minister of Pensions and National Health from 1930 to 1935 and Lieut. Governor of New Brunswick from 1935 to 1940.

The New Brunswick Museum in Saint John and the University of New Brunswick commanded his attention for many years. His acquaintance was countrywide and an excellent memory enabled him to recall names in an unusual manner.

During his long life he interested himself in a great variety of organizations, comprising, church, civil, provincial and national bodies. All of these benefited through the stubborn integrity of this Scottish son of New Brunswick, whose philanthropy was wisely bestowed.

The Honourable Murray MacLaren

An Appreciation

By the death of Colonel the Honourable Murray MacLaren not only Saint John, in which most of his life was spent, but the Province in which he was widely known and of which he had been a Lieutenant-Governor, and the Dominion as well, lost a citizen whose unusual qualities had brought to him many opportunities for public service.

As a comparatively young practitioner he gave of his time to the militia in which he served various units as an assistant surgeon. This led him to recruit and command No. 8 Stretcher Bearer Company and No. 8 Ambulance Company in 1900. In this capacity he was the father and founder of the R.C.A.M.C. as organized in New Brunswick. At the outbreak of the first Great War he went overseas and successively commanded No. 1 Canadian General Hospital and Granville Canadian Special Hospital. In this connection his services were recognized by the bestowal of the C.M.G., and Portugal conferred upon him the title of Commander of the Order of Avis. His work in the St. John Ambulance Association brought to him the distinction of a Knight of Grace of the Order of St. John of Jerusalem. The local Red Cross Association had also the benefit of his membership and advice, and he found time to interest himself in the work of the Boy Scouts. When Lieutenant-Governor he became the patron of the New Brunswick branch of that body and his sustained interest in its activities was so great that after his term of office expired he was continued as patron up to the time of his death.

In August, 1939, he met with a severe auto car accident which endangered his life, and after a tedious recovery he carried on in a seriously crippled condition. At the time of the accident he did not think of himself but gave directions for the care of others who were injured. Only his professional knowledge and indomitable will carried him successfully through his long and painful ordeal. Yet after his recovery, though unable to move without considerable distress, he surprised the Boy Scouts and many similar organizations by appearing unexpectedly at many of their meetings and taking part in their deliberations.

The son of Dr. Laurence MacLaren, he was early destined for the medical profession. His education, begun at the old Grammar School in Saint John, was continued at the University of New Brunswick from which he proceeded to the University of Edinburgh, afterwards doing postgraduate work in London and Vienna. A few years ago, while Lieutenant-Governor of New Brunswick, he journeyed to Edinburgh where he received the degree of LL.D., an honour which he greatly prized. He was a member of the Royal College of Surgeons and was a Fellow of the American College of Surgeons as well as of the Royal College of Surgeons (Canada). He had an almost life-long association with the General Hospital in Saint John where he served on the surgical staff. He was also President of the Canadian Medical Association in 1913.

When at the age of sixty he decided to enter political life, he fought a strenuous campaign and was successful in the election of 1921. He was re-elected in 1925, 1926 and 1930, and upon the accession of the Rt. Hon. R. B. Bennett to power became Minister of Pensions and National Health which position he held until 1935. He brought to the manifold problems of that department a mind specially trained by his wide professional experience and left a distinctive mark upon that administration, no detail of which was too small for his careful consideration. As Lieutenant-Governor of his native province from 1935 to 1940 he was assiduous in the performance of the duties of that office, visiting all parts of the Province and in every locality doing his best to stimulate the interest of the people in some useful enterprise. Born in the village of Richibucto, April 30, 1861, he paid special attention to that locality and was instrumental in making a collection of portraits of the men who had been prominent in its affairs or

who, in other departments of life, had risen to eminence, like the Rt. Hon. Bonar Law, whose birthplace it was. He also was responsible for a collection of the portraits of the Governors of New Brunswick from its inauguration which he presented to the New Brunswick Museum, an institution to which his gifts were not only liberal but lavish. He contributed to the site of the museum and completed and furnished at his own expense the King George VI. Auditorium, which was opened by H.R.H. Princess Alice. Those present at the ceremony will remember under what difficult physical conditions he officiated on that occasion.

In religion he was an uncompromising supporter of the "Continuing" Presbyterians and the Church of St. John and St. Stephen in Saint John received his loyal and enthusiastic support.

Trained by his profession to observation, analysis, method and judgment, he brought a well-stored mind to the consideration of every problem. What he did was done without haste, by the orderly processes of his mind. He made himself master of a subject, going at times into almost meticulous detail to assure himself of the justice of his conclusions, from which, when he had arrived at them, there could be no deviation. His whole life was marked by rigid integrity and a wholesome tenacity of purpose.

To his wife, who predeceased him by some years, he owed much. She sustained him in all his efforts and smoothed the difficulties which beset his professional path. Sincere, lovable, kindly, one may feel that without her help he might not have attained quite all that he accomplished.

HON. DR. J. B. M. BAXTER,
Chief Justice of New Brunswick.

Dr. Jabez Henry Elliott, professor of the history of medicine, University of Toronto, died on December 18, 1942, at his home, 11 Spadina Road. He was president of the American Association of the History of Medicine and was a past president of the Academy of Medicine.

Dr. Elliott was the physician in charge of diseases of the chest, St. Michael's Hospital; physician at the Hospital for Sick Children and also the I.O.D.E. Preventorium. Since 1907 he had been a consulting physician in Toronto.

Born at Hampton, Ont., in 1873, Dr. Elliott was the son of Henry and Nora Grace Yeo Elliott. He received his education at Bowmanville High School, University of Toronto, University of Liverpool and Johns Hopkins University. In 1898 he was appointed physician in charge of the Muskoka Cottage Sanatorium, which post he held until 1907.

Appointed a teacher in medicine at the University of Toronto in 1907, he was made Professor of the History of Medicine in 1931. He served through the first Great War with the C.A.M.C., and held the rank of lieutenant-colonel.

From 1914 to 1918 he was treasurer of the Ontario Medical Association. In 1918 he was elected president of the American Climatological and Clinical Association and from 1927 to 1929 was president of the Canadian Tuberculosis Association. He was for four years vice-president of the American College of Physicians. He was a member of and held executive offices with National Tuberculosis Association, the American Sanatorium Association, Ontario Laennec Society, Medical Historical Club, Æsculapian Club, Toronto Society of Occupational Therapy and Muskoka Lakes Association.

Dr. Elliott represented the University of Toronto at the 11th International Congress on History of Medicine at Yugoslavia in 1938 and the Congress at Madrid and Toledo, Spain, in 1935. He was a member and past president of the Canadian Military Institute; member of Hart House and Faculty Union, Muskoka Lakes Golf and Country Club, Golden Rule Lodge, A.F. and A.M., Gravenhurst, of which he was a past master, and University Lodge, A.F. and A.M., Toronto; St. Paul's Chapter, R.A.M., Cyrene Preceptory, and a member of the Grand Lodge since 1902. He had been a reserve officer since the first Great War. He was a member of several university fraternities and was the author of numerous publications on medicine and the history of medicine.

His wife, Mabel Tait Elliott, predeceased him in 1922. Surviving is a daughter, Mrs. Charles P. Holmes of Ottawa.

AN APPRECIATION

The death of Dr. Elliott from angina pectoris on December 18th was most unexpected. He had suffered from some slight symptoms since midsummer, but apparently the end came very peacefully. He had led a full and vigorous life throughout his sixty-nine years, except for a temporary severe arthritis and neuritis of ten years ago. Widely known in Canada, the United States and Great Britain, his loss will be regretted by a host of friends among whom are his numerous patients.

Following a brilliant course in medicine at the University of Toronto, while engaged in physiological research, Elliott was asked to become the Medical Superintendent of the recently opened Muskoka Cottage Sanatorium. This pioneer venture in Canada for the treatment of tuberculosis had been undertaken by the National Sanitarium Association when formed in 1896. Unusual as it was at this time for a well man to enter such work, Elliott took charge in February, 1898, of a charming institution with great possibilities but as yet lacking much in organization and service. In order to make things go he was obliged to play many parts in the interests both of his patients and the sanatorium.

After two years of hard work Elliott was given leave of absence for a year to study in Europe. He spent six months in clinical work and in visiting celebrated sanatoria in Germany and Belgium, and six months with the Malaria Expedition to Nigeria, a second research enterprise sent to West Africa by the Liverpool School of Tropical Medicine. Two memoirs on Malarial Fever and on Filariasis resulted, to which Elliott was a joint contributor with his two companions.

On his return he gave himself ardently to the interests of his patients, the sanatorium, and the anti-tuberculosis movement then developing in Canada and the United States. He planned the Muskoka Free Hospital, a second sanatorium built by the Association and opened in 1902. He wrote and spoke freely in the interest of anti-tuberculosis measures, and radiated a wide influence on this continent. In 1903 he was encouraged by election to the American Climatological Association, and, at the Tuberculosis Exposition held at Baltimore in 1904, the first of its kind, he became a Founder Member of the National Tuberculosis Association.

When, early in 1907, Dr. Elliott resigned from the Sanatorium to practise as a specialist in tuberculosis, he brought to Toronto qualifications which no doctor had previously had. His intimate experience for more than nine years with tuberculous patients under his daily care, his familiarity with the methods of the best sanatoria in America and Europe, his knowledge of the rapidly increasing literature dealing with tuberculosis, and his own technical ability, combined to make him an exceptional consultant in this first decade when tuberculosis was so rife. Throughout the whole forty-five years of institutional and consulting practice, he drew patients from a wide area.

After further postgraduate work at Johns Hopkins, Elliott was taken on the staff of St. Michael's Hospital, where in 1907 all cases of tuberculosis in any service were placed under his care. In 1909 he became Senior Assistant on the second medical service, and the same year he was given a footing for teaching in the University by being made an Associate in Medicine. By 1929 a third service for respiratory diseases had been established of which he was the head. In 1915 he became Director of the Out-Patient Chest Clinic. He gave clinics to the students in both wards and chest clinic for thirty-five years. The opportunity to work in a general hospital after his early specialization constantly broadened his experience in internal medicine, a reversal of the usual procedure in specialism.

Elliott became physician to the new I.O.D.E. Preventorium in 1912, and assistant physician to the Hospital for Sick Children in 1913, where he was an Associate of Dr. H. C. Parsons in the Chest Clinic. At both of these institutions he gave clinics, and also special lectures at the Hospital for Sick Children.

He entered the C.A.M.C. as Lieutenant early in 1915, and by 1918 was a Lieutenant-Colonel. During much of this time and subsequently he was consultant in respiratory diseases to the hospitals in M.D. No. 2. Thorough in reviewing the history, he assessed the data quickly and without bias, and made up his mind at once. A former member of the staff of the Spadina Hospital believes that his frequent forthright opinion: "Chronic bronchitis preexisting enlistment, no evidence of aggravation by service, recommend discharge"—saved the country great expense. His reviews of pension cases were admirable and highly valued by the Pensions Board.

Throughout his life Elliott was an early advocate of many now established public health measures. In the campaign for pure milk, begun in 1908, the Milk Commission of the Canadian Medical Association added Elliott to its membership, and later he became Secretary to the Commission for five years. The Ontario Milk Act of 1911 was one result of the Commission's efforts. Elliott was a driving force in the well organized survey of children by examination and tuberculin in Wentworth County in 1923. For the last eighteen years he was a special lecturer on Public Health and Medicine in the School of Nursing at Toronto University.

He belonged to many societies here and in the United States, in all of which he held office. He was also president of several. The Toronto Academy of Medicine, especially, offered interest and opportunity for his energies. He had been a member of the Library Committee for thirty years, but always refused to be chairman. Books were his pleasure and preoccupation, and successive librarians speak feelingly of his interest and support. He had a coordinated knowledge of authors and books which helped materially in the well-balanced selection of upwards of 20,000 volumes added to the library during his period of service. For long he had been a prowler in second hand bookshops when on his extensive travels. To his friends his familiarity with what the Academy Library contained and where to find it was quite uncanny. As Honorary Librarian to the Canadian Military Institute for nineteen years he was equally interested and effective.

He has to his credit seventy published papers, more than half on clinical and public health subjects, five on the natural sciences, and sixteen on the history of medicine, and also twenty unpublished addresses.

With this background it was logical and appropriate, when the opportunity offered in 1931, that he should succeed to the chair of Professor of the History of Medicine in the University of Toronto. The long-delayed promotion in university rank may be explained as a penalty of specialism. Able as he was, the sole member of his class to have graduated with honours, gold medallist for his final year, and George Brown Research Scholar, more rapid advancement in the University might have been anticipated, but his very special knowledge of a well cultivated corner of the field of internal medicine sidetracked him from the broad highway in university teaching.

On looking through the record of Elliott's varied activities, one is impressed by his courage and effectiveness. Steadfastness and reliability were marked attributes. Through dogged persistence he accomplished an enormous amount of work. He was a staunch friend to his fellows and patients, for whom he would do unexpected kindnesses, generous in appreciating the work of others, and never critical of anyone. Invariably cheerful and of good humour, he was a delightful companion to go afield with because of his keen observation and knowledge of what was to be found in the countryside. He has fallen like one of his beloved great trees in the forest.

CHARLES D. PARFITT

Major Stanley Liddelow Seymour, Royal Australian Army Medical Corps is reported as killed in action on October 25, 1942, at El Alamein. Dr. Seymour was born in New Haven, Conn., on November 14, 1910. He graduated in Medicine from McGill University in 1935, and after a year's internship at the Montreal General Hospital went into practice. He joined the Royal Australian Army Medical Corps and saw much service in the Middle East. After being in Palestine he was with the first advance to Benghazi and later commanded a hospital throughout the siege of Tobruk. After this siege was raised he returned to Palestine and then Syria. He was then recalled to front line duty and was with the 8th Army all through its stand at El Alamein. He was killed there at the beginning of the successful offensive of October, 1942. He leaves a wife (Elizabeth H. Elliot, of Montreal), in Adelaide, Australia.

Dr. Arthur George Aldrich, aged 79, for 44 years a practitioner in Port Hope, Ont., died on December 13, 1942. Born in England, he came to Canada as a youth and attended Victoria University. His first practice was in Newtonville.

Dr. Joseph William Browning, Canada's oldest practising physician and one of the world's first telegraphers, died at Exeter, Ont., aged ninety-nine, on December 20, 1942, following an illness of less than a week.

Dr. Browning, who had practised there for 74 years, was available for consultation at his office until December 15th when he was stricken. He started his medical practice in Exeter three days after Confederation in 1867. No other physician in Canada could claim such a long term of continuous practice. In latter years, his son, Joseph, a local druggist, had wheeled his father to work in the morning and returned him home in the evening.

Before entering the medical profession, Dr. Browning mastered the telegraph key in the 1850's shortly after Samuel Morse startled the world with his invention. Dr. Browning was born in England and came to Canada at the age of two years. He was a graduate of Victoria University (1867).

Dr. Eli A. Daniels, of Montreal, who was honoured last July with a fellowship in the Royal Society of Medicine, London, in recognition of special merit in the field of proctology, died suddenly on December 22, 1942, in his 39th year.

At the time of his death he was director of the department of rectal surgery at the Women's General Hospital.

Dr. Daniels was a graduate of McGill University, receiving his M.D. and B.Sc. degrees in 1927, and his M.L.C. in 1928. In 1932 he went to London, England, and worked with the leading proctologists at St. Mark's Hospital, later returning to Montreal and specialized in proctology.

He was a Fellow of the American Association for the Advancement of Science and of the American Proctologic Society of the Sigma XI and the Smithsonian Institute, Washington; and a Fellow of the Royal Society of Medicine, London, England, being the first Canadian included in the proctology section of the society.

Dr. Charles Auguste Decary. Stricken with a heart attack while addressing a meeting of several hundred doctors and health specialists on December 17, 1942, Dr. Decary, medical superintedent of the Ste. Jeanne d'Arc Hospital, Montreal, prominent in local medical and social circles, collapsed and died five minutes later. He was in his 46th year.

Dr. Decary, whose heart had been affected for several years, was one of the principal speakers to address the gathering. He had just started an address on the hospitalization insurance plan when stricken. Other physicians present immediately went to his aid,

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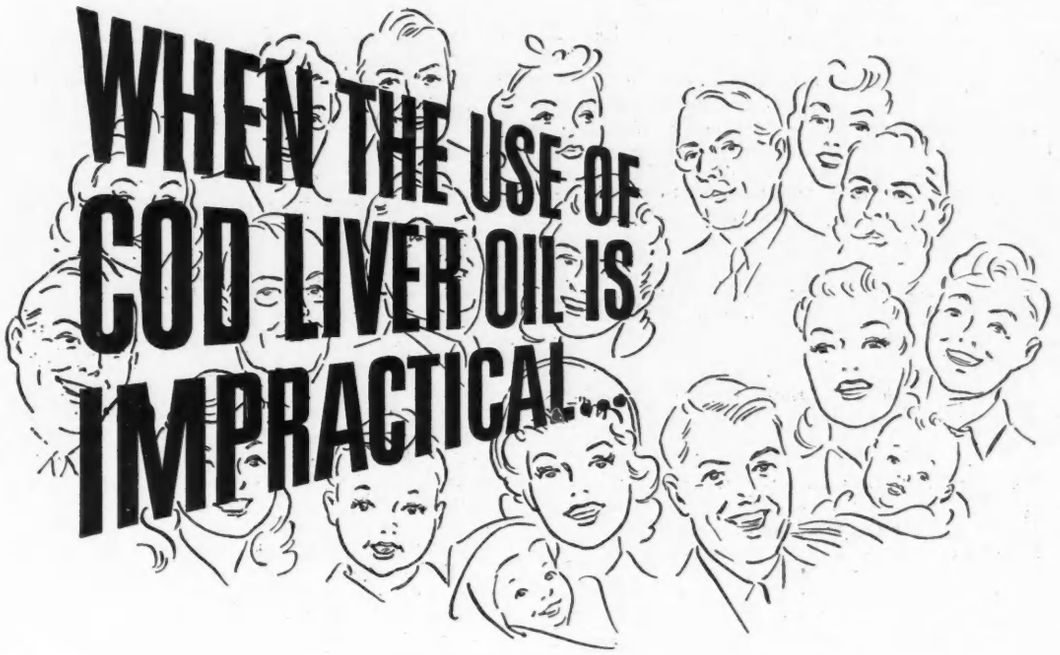

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but their efforts were unavailing and he died within five minutes.

The meeting was being held in the new McGill College Avenue premises of the Ciba Company, Ltd.

Dr. Decary was born in Montreal. He studied at St. Mary's College before entering the University of Montreal, where he graduated with his medical degree (1922). He served his internship at the Hotel Dieu, then took postgraduate studies in Boston. He later returned to the medical staff of the Hotel Dieu. He entered the Ste. Jeanne d'Arc Hospital a few years prior to his appointment as superintendent in February, 1936. He was a member of the Reform Club, and the Cercle Universitaire.

Dr. Donald L. Fee died suddenly at Alliston, Ont., on January 2, 1943. He leaves a widow and one son, Douglas.

Dr. J. F. McCracken, of Hagersville, Ont., died on December 27, 1942, in his 53rd year.

Dr. Albert Henry Rondeau died in the Winnipeg General Hospital in 1942 after an illness of almost five years. Born in Rawdon, Quebec, in 1881, he received his education at Point-aux-Trembles College, McGill Normal School, Bishop's College, Lennoxville, and in medicine from Manitoba Medical College. Graduating in 1905, he practised at Shoal Lake for a year, then came to Winnipeg where he carried on a general practice until he collapsed while at work. He is survived by his widow and a sister.

Though he was an able practitioner, it is as an after-dinner speaker that he will be remembered by those who knew him in his heydey. It was then that his delightful whimsicality and play of fancy were revealed, and the effect was heightened by the accent of his native province.

Lieut.-Col. Charles E. St. Pierre, of the Central Medical Board in Montreal, died suddenly on January 11, 1943, in his 64th year.

A native of Three Rivers, Colonel St. Pierre was a veteran of the Great War in which he served in the Royal Canadian Army Medical Corps. Posted to No. 4 Stationary Hospital in 1915 he subsequently served in France with No. 6 and then No. 8 Canadian General Hospitals. He had attained the rank of major by the end of the war, and in 1920 he was promoted to the rank of lieutenant-colonel and given the task of organizing No. 4 (Res.) Stationary Hospital. He went on the Reserve List in 1928, but on the outbreak of the present war again offered his services and was appointed to the Central Medical Board.

Dr. Robert Elgin Towle, a medical practitioner in Toronto for 22 years, died at his home in Toronto on January 3, 1943.

Born at Kintore, he received his education at Ingersoll High School and graduated in medicine from the University of Toronto in 1888. Before coming to Toronto he practiced in Kintore, Dublin, the Parry Sound district, Hastings County and Pickering. He had been retired for five years. He was a member of the Masonic Order, the I.O.O.F. and the I.O.F.

Surviving are his widow, three daughters and a brother.

Dr. Charles W. Wilson, of Edmonton, died on December 24, 1942, at the age of 76 years. He retired many years ago from active practice, and had lived on his farm near Bremner. His early medical life was an active one. He graduated from McGill University in 1886. Following this he took postgraduate work in London, where he took his M.R.C.S. He also studied in Germany. For several years he was attending surgeon to the Montreal General Hospital. At the time of the Boer War, he became a Lt.-Col. of the Royal Horse Artillery. In 1911 he was Surgeon Major, and was asked by Sir Wilfred Laurier to make a special trip through Northern Canada with the North West Mounted Police, and he remained in this area until 1914.

He is survived by his widow and one daughter.

News Items

Alberta

There were three elections in the Province of Alberta for Representatives on the Council of the College of Physicians and Surgeons, with the following results: District No. 2 Lethbridge, Dr. Stuart M. Rose, Lethbridge; District No. 4 Camrose, Dr. L. M. Rogers, Camrose; District No. 6 Calgary, Dr. W. A. Lincoln, Calgary.

Dr. W. V. Lamb of Camrose, left his district which he had represented on the Council since 1923, moving to Alexo, thus was not a candidate in the recent elections. His place is being taken by Dr. L. M. Rogers, a Manitoba graduate of 1919, who has been practising in Alberta for over 22 years.

Dr. R. B. Francis, of Calgary, who has served on the Council for ten years, declined to run, and his place was taken by Dr. W. A. Lincoln, F.R.C.S.Eng., who has been a resident of Alberta since 1907. He has been in practice in Calgary since then.

The Council of the College of Physicians and Surgeons has been called in special meeting to discuss the question of Federal Health Insurance. It has invited representatives of the Alberta Division of the Canadian Medical Association, the University of Alberta, and the Provincial Department of Health. The question of Health Insurance is being very much discussed these days, and the profession feels that when the final Act is passed, all views should be considered, and the result should be fair and just to all sections of the people. The patients should get the best possible services, the doctors and the dentists should be reasonably remunerated for their services, the hospitals and the nurses should be equitably provided for, and withal, the people who pay the bill must get a proper return for their expenditures. It will be a success only if all parties to the scheme are co-operative.

There has been much written as to the depletion of adequate medical services in Alberta, a very sparsely settled province, owing to the call for medical men in the forces. Much data will be presented to the Council on this subject and the necessary attention to it will be given.

Dr. J. Scovil Murray, who for many years practised in Calgary, has moved to Vancouver, where he intends to practise.

Dr. R. G. Huckell, of the University of Alberta, addressed the members of the Calgary Medical Society on "The painful shoulder" on December 14, 1942.

G. E. LEARMONTH

Dr. A. E. Archer of Lamont, Alta., President of the Canadian Medical Association, told graduating medical students at the University of Alberta's convocation on January 2, that more than 3,000 doctors of Canada's estimated 10,000 peacetime practitioners now are doing

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war service, thereby creating a doctor shortage in the Dominion.

Delivering the convocation address, Dr. Archer said of the 3,000 doctors in the services; one-third are serving overseas.

There were 112 medical officers in advanced and basic training centres, several dozens doing medical work in Canada's 19 internment camps, and scores more on the staffs of 126 mobile hospital units.

There were 97 full-time and 112 part-time doctors functioning under the Department of Pensions and National Health, he said. All these had been removed from civilian practice by the war.

British Columbia

A largely attended meeting of representative medical men from all parts of the Province was held at the Hotel Vancouver on January 7 to consider what action we should take with regard to the results of the recent meeting of the Committee of Seven with the Federal Advisory Committee in Ottawa. The Canadian Medical Association has called a meeting of General Council in Ottawa on January 18 and British Columbia decided to send its full share of delegates, whose expenses will be defrayed by a special grant made by the Council of the College of Physicians and Surgeons of British Columbia. Amongst those who it is hoped will attend, are the following: Drs. F. M. Auld, Murray Blair, C. H. Hankinson, H. McGregor, Thomas McPherson, G. O. Matthews, H. H. Milburn, A. H. Spohn, G. F. Strong, H. M. Robertson, M. W. Thomas.

This meeting dealt too with the whole question of Health Insurance and the attitude that we should adopt as an organized body. This subject is becoming a very live one and it is obvious that some definite decision will be made in the near future.

As a result of some of the stringencies in fuel, food, etc., imposed by the War, the medical profession is encountering new problems. This is notably the case with regard to fuel, which has become very scarce in Vancouver and the surrounding district. A great deal of hardship has resulted to families where there are very old or very young people, or where there is sickness, and medical men are continually asked for certificates which may help to induce the fuel controller to make special concessions.

The whole subject has quite a bearing upon the hospital situation as it leads to prolongation of stay in hospital where home conditions are especially bad, and with our present shortage of hospital beds this is a serious matter. Now we are told that such things as condensed and evaporated milk are to be rationed or at least limited in their sale, and many medical men have been asked for certificates in this regard too. Truly the bill against Adolf Schickelgruber is mounting to a dizzy height.

Speaking of hospitals, there is a very great shortage of beds, at least in the lower mainland, and especially in regard to maternity wards, which are continually full to overflowing. One wonders how this situation will be met if a Health Insurance scheme is ever adopted, with the inevitable increase in demand for hospitalization that this will bring.

A long-delayed general practice by the Air Raid Precautions authorities is scheduled in Vancouver and vicinity for January 11th. Aeroplanes will fly over the city dropping flares and "incendiary" bombs and all A.R.P. workers, doctors, first aid men, hospitals, nurses and assistants of every description have been warned to be at their posts. Attempts have been made to hold this practice on two or three occasions, but something has always intervened.

The restrictions on gasoline are beginning to make themselves felt by medical men, whose supply of coupons is becoming more and more inadequate to meet the demands of practice. It is only fair to say that the department in control of this vital necessity has made every effort to meet the needs of doctors in this regard, as has also been the case with regard to tires, and it is felt that all legitimate needs will be met.

J. H. MACDERMOT

Manitoba

On December 21 St. Boniface (Grey Nuns') Hospital opened a new maternity ward (St. Mary's) of 27 beds for private and semi-private patients. Accommodation for 40 public patients is afforded on St. Anthony's ward. The new maternity ward comprises two delivery rooms, nurseries, doctors' room, and rooms for patients in labour as well as after delivery. The newly opened ward is thoroughly equipped and is of the most modern construction. The corridors are sound-proofed, and each room has good outside light.

The change in obstetric practice from domiciliary to hospital delivery is well illustrated in the history of this hospital. From 1909 to 1912 only a few maternity cases were admitted. Whenever it was possible these patients were sent to the Misericordia Hospital where St. Boniface student nurses got their training. In 1916 a maternity ward consisting of from 2 to 6 beds and a delivery room was opened. During the year 1920, 223 cases were admitted. In 1921 a new maternity department of 13 beds and 2 delivery rooms was opened. In 1924 there were 433 cases delivered. In 1928 an addition of 22 beds was made. In 1931 there were 852 patients. It was found necessary to admit only public and staff patients on St. Anne's ward, with private and semi-private patients on Youville ward. In 1932, 1,081 cases were hospitalized and in 1940 four more beds were added to St. Anne's ward. In 1941 the number of cases delivered was 1,649.

A dinner was held in the Royal Alexandra Hotel, Winnipeg, on December 21 in honour of Dr. I. Herbert Davidson on his retirement as Chief Anæsthetist, St. Boniface Hospital.

ROSS MITCHELL

New Brunswick

Dr. George Skinner presented a paper and a number of case reports on "Hip injuries" at the regular meeting of the Saint John Medical Society on December 10, 1942. The attendance was large and the surgical discussion was free and informative. Several cases of fractures of the surgical neck of the femur were demonstrated, the treatment involving the use of the Smith-Peterson nail. In spite of the number of doctors overseas and in the armed forces, interest in our clinical meetings is still keen.

The New Brunswick Medical Society and its branch societies throughout the province have, through the press, asked for co-operation of the public in an effort to save doctors' time, tires, and gas, by placing calls during daylight hours and as early in the day as possible. It is felt that this co-operation is forthcoming.

Dr. J. S. Hynes of Fredericton, was recently elected Secretary of the Fredericton branch of the St. John's Ambulance Association.

Wing-Commander Fred Cheeseman has been invalided out of the Air Force Medical Service and is resuming practice in New Brunswick, probably in Saint John.

The executive committee of the New Brunswick Medical Society held its fall meeting in Saint John early in December. It was decided to hold the regular annual meeting of the Society in Moncton in sequence with the annual meetings of Nova Scotia and Prince Edward Island. This decision was arrived at after some discussions as it was evident that such a local meeting

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would not impose any appreciable extra load on transportation systems.

The New Brunswick Local Procurement and Assignment Board met in Saint John in December: present were the local members and Lt.-Col. A. A. James, D.M.O., M.D. No. 7, Dr. Chas. MacMillan, Chief Medical Officer, P.N.B., and Major C. Belyea, the representative of the D.O.C., M.D. No. 7. The chairman and Lt.-Col. James reported on various matters which had been completed by them in relation to N.R.M.A. recruits and the procurement of physicians for the armed forces. A question period brought up to date the information available on civilian coverage, Public Health Service and enlistment of doctors for active service. Up to date 30% of the practising physicians in New Brunswick have joined one of the three medical services.

Dr. T. Earle Grant of Saint John has returned from a six weeks' surgical postgraduate course in New York.

A. STANLEY KIRKLAND

Nova Scotia

Approved by the American College of Surgeons, following its 25th annual survey, were these hospitals: Highland View,* Amherst; St. Martha's, Antigonish; Nova Scotia Hospital, Dartmouth; Glace Bay General, St. Joseph's, Glace Bay; Camp Hill, Children's,* Grace Maternity, Halifax Infirmary, Tuberculosis Hospital,* Victoria General, Halifax; Nova Scotia Sanatorium, Kentville; Aberdeen,* New Glasgow; City of Sydney Hospital,* St. Rita's, Sydney; Eastern Kings Memorial, Wolfville; Yarmouth Hospital, Yarmouth. (The asterisk indicates provisional approval.) Missing from the list as compared with those of other years were a few hospitals, probably the victims of war-time conditions.

The Royal Canadian Navy proudly threw open the doors of its new, and first permanent hospital, at Halifax; 175 beds, four floors, modern structurally, surgically and medically, the new institution, which has galleys instead of kitchens, is true to the finest naval and hospital standards. In charge is Surgeon-Commander Donald Webster, assisted by Surgeon-Lieutenant F. McHattie. With the temporary hospital built a year ago, and accommodations in nearby barracks, there are now 400 hospital beds on thhe Admiralty house grounds.

Colonel G. R. Forbes has been appointed District Medical Officer of Military District No. 6, with headquarters at Halifax.

Dr. R. Simm Gass (Dal. '25), of Nashville, Tennessee, and originally of New Glasgow, has been appointed superintendent of the new Middle Tennessee Tuberculosis Hospital.

Keeping pace with the increased wartime output in all fields were the 3,400 babies born in Halifax in 1942; 70% greater than peace time levels and an all-time city record, this meant hard work for the obstetricians, and the hospitals under whose roofs 90% were born. Because many babies indicates a good, hardy race, this also meant more troubles for democracy's enemies.

Thirty-seven young men of the Maritime Provinces and Newfoundland, the entire 1943 class of Medicine at Dalhousie, stepped on the Convocation platform on the evening of January 5, 1943, to be capped Doctors of Medicine and Masters of Surgery by President Carleton Stanley, at the special Medical-Dental convocation. Said President Stanley, "Every university man knows that unless we win this war there will be no universities". Publicly, the young men said nothing but, with a few exceptions, turned from convocation to the Dominion Council examinations, and thence to His Majesty's services.

Surgeon Lt.-Commander C. H. Best, R.C.N.V.R., addressed the graduates on "Medical research in peace and war". Research, today, he explained, is thriving, with adequate support. But it is a special type of research, prompted by the needs of war. Dr. Best made a plea for the carrying of the present impetus into the post-war world, a plea that medical research be not overlooked in the coming medical economics, and a plea to the graduates that, "you consider well the merits of medical research and the services you may thereby render to your fellows".

As a result of the mid-term examinations, and because of "previous delinquencies" 11 students, including 2 medical students, were obliged to withdraw from the university and, presumably, into the arms of the Divisional Registrar of National Selective Service. On this matter President Stanley made the statement: "It is rarely that the faculty takes such action in mid-term . . . there has been something of a hue-and-cry about the universities of Canada 'sheltering draft-dodgers' . . . Dalhousie . . . has always taken elaborate precautions about its entrance standards. It has never aimed at numbers, or large enrolment, whatever its financial difficulties have been. But it must be confessed that sometimes mistakes are made. Some boys, who were rather doubtfully admitted, proved to be good students. On the other hand, some who have a clear school record are quite unable to take the university hurdles. The faculty try, as early as they can, and, not later than the second year, to discover those who are attempting vainly. Then, in kindness to the students themselves, they advise them to withdraw". . . .

Unofficial comments of medical school teachers suggest that students of third, fourth and fifth years gave tangible evidence, on their examination papers, of ill effects of the rushed medical course.

ARTHUR L. MURPHY

Ontario

Work has been begun on the new wing of the Toronto East General Hospital, which it is expected will be completed this fall. It is to be a five-storey building, constructed at a cost of $500,000, and is designed to alleviate crowded conditions and to provide for war emergencies.

Tribute was recently paid to Dr. Augusta Stowe Gullen, first woman to obtain her medical degree from a Canadian university, who this year marks her diamond jubilee year of graduation. Dr. Gullen's mother, Dr. Emily Howard Jennings Stowe, was the first woman to practise medicine in Canada but she obtained her degree in New York.

At the opening of the Ontario Women's Medical College, Dr. Gullen was appointed Demonstrator of Anatomy, later Lecturer on Children's Diseases, and subsequently Professor of Pædiatrics, a position she held until the Ontario Women's Medical College was amalgamated with the University of Toronto. She also represented the medical profession on the Senate of the University of Toronto from 1910 to 1922.

Among those in service who were included in New Year's promotion list, we find the following: Dr. Charles Best promoted to the rank of Surgeon-Commander; Dr. James Wallace Graham, Toronto, to Acting-Surgeon-Lieutenant Commander; Drs. Chesley M. Oake, Oakville, Donald Young Solandt, Toronto, Wilfred Keith Welsh, Toronto, Marvin C. Wellman, Oshawa, and J. H. C. McClelland, Mimico, to Surgeon-Lieutenant Commander.

Brigadier G. Brock Chisholm, M.C. and bar, of Oakville, Director General of Medical Services, was given the rank of Commander of the Most Excellent Order of the British Empire in the New Year's honour list.

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After seven months' research, scientists in Canada have developed a highly nutritive, longer lasting emergency ration designed to give the men of the Royal Canadian Navy a better chance to survive if their vessel is blown away from under them. The kit is unique and was included in the Canadian naval war exhibition held under the auspices of the Navy League of Canada at the Robert Simpson Company, Toronto, early in January.

Those scientists responsible for the emergency ration are Lt. James Campbell, biochemist of the navy's special branch and head of the nutritional section of the Navy's medical research unit; W. G. E. Eggleton, formerly Professor of Biochemistry at Lester Institute, Shanghai, and now a member of this research unit in Toronto; Lt. J. E. Debelle, formerly General Superintendent of the Children's Memorial Hospital, Montreal; Lt. Reginald W. Millard, technical expert of naval stores, Vancouver; Commander R. A. Wright, paymaster Director-General of the Navy; Surgeon-Captain A. McCallum, Medical Director-General of the Navy; and Major A. B. Coulter, Acting Director of Naval Stores.

Dr. H. V. Morris, a graduate of Queen's University 1936, who practised in Hamilton and Shelbourne, Ontario, is reported a prisoner of war in Seoul, Korea. Dr. Morris was the only Ontario doctor with the Armed Forces serving in that part of the east. He had been stationed at Singapore.

On December 19, 1942, forty-five old friends and associates of Colonel F. S. L. Ford, C.M.G., assembled at the Canadian Military Institute, Toronto, to tender him a banquet and present him with an illuminated address. Colonel Ford replied feelingly. Among senior officers present were Colonel P. Goldsmith, C.B.E., Colonel Wallace Scott, C.M.G., V.D., Colonel Duncan Graham and Colonel A. R. Hagerman, M.C., E.D., the latter being District Officer M.D. No. 2. Lieut. Colonel M. J. Wilson, E.D., acted as Mess President, and the address and toast to Colonel Ford were presented by Lieut. Colonel W. J. Deadman, V.D.

Dr. F. Robert Wilkinson returned to Toronto recently after serving as attaché for a year to a Canadian orthopædic unit in Scotland. The unit, which was set up under the sponsorship of the Canadian Red Cross and the Canadian Medical Association, is comprised of 360 beds and is staffed by eight Canadian surgeons and 22 Canadian nurses, and was established in March, 1941, following the Blitz on Glasgow which resulted in heavy casualties. Dr. Wilkinson is on six months' furlough from his Glasgow post.

Dr. John Orr, Professor of Bacteriology at Queen's University has been appointed Director of the Ontario Government Laboratory at Kingston. He will administer the Provincial public health diagnostic work for the Kingston area in addition to carrying on his regular University duties.

It is with deep regret that this Division records the passing of its Divisional Representative on the Editorial Board of the *Journal*. Dr. Jabez Elliott passed away on December 18th. We have lost an ardent supporter of organized medicine and his faithful devotion to the interests of the *Journal* makes his place difficult to fill.

Quebec

Dr. Adelard Groulx, director of the city of Montreal health department, was elected president of the Société Médicale de Montréal, at the society's annual meeting, December 16, 1942, at the University of Montreal. He succeeds Dr. G. L. Prud'homme. Other officers are: Dr. J. U. Gariepy, vice-president, and Dr. Paul Letondal, secretary-treasurer, the latter re-elected for a fifth term.

In his annual report Dr. Letondal noticed that in spite of the war the organization had been able to maintain its position and activities. Many members are in the army and others in civil life have seen their duties increase considerably.

The society now has 500 members and Dr. Letondal expressed the hope that this number would be increased considerably as the result of a membership campaign to be conducted next year.

Dr. Letondal offered condolences to the family of Dr. Alphonse Ferron, who died recently. He paid tribute to the work of Dr. Prud'homme, retiring president.

The Société Médicale is the oldest French society of its kind in Montreal. It was founded in 1900.

Le dernier numéro de la *Revue Canadienne de Biologie* de 1942 vient de paraître. C'est le 7ième fascicule paru au cours de l'année. La Revue qui avait promis 500 pages de texte à ses abonnés leur en a fourni 800.

Messieurs Dugal et Laugier exposent leurs recherches sur la cicatrisation des plaies et sur l'influence accélératrice que manifestent à cet égard les substances comme l'acide oxalique et l'oxalate de sodium qui précipitent le calcium. Ces recherches doivent comporter des applications au traitement des plaies de guerre.

Messieurs Masson, Riopelle et Simard dans un travail largement illustré exposent l'origine de certaines tumeurs communes aux deux sexes.

M. Cahen met en relation l'efficacité de certaines substances qui provoquent le sommeil avec leurs constitutions chimiques.

Enfin, Messieurs Babkin, Schachter, Dworkin et Rosenberg démontrent une méthode qui permet de conserver pendant plusieurs jours l'acétyl choline dans le sang.

A la suite de ces mémoires se trouve une bibliographie de livres récents sur la Biologie et la Médecine. Enfin ce dernier fascicule comprend une table des matières par auteurs et par sujets correspondant à toutes les publications parues dans la Revue au cours de l'année.

General

The American Board of Internal Medicine.—The registration and examination fee of the American Board of Internal Medicine is to be reduced from forty dollars to thirty dollars. The certificate fee will remain at ten dollars, making a total of forty dollars. The oral examination fee in the sub-specialties will remain at ten dollars.

This reduction in fees will become effective as of January 1, 1943, and will apply to candidates for the written examination on February 15, 1943, whose applications have not been accepted for a previous examination.

Book Reviews

Ophthalmology and Otolaryngology. Military Surgical Manuals, No. 2. Prepared by National Research Council (U.S.A.). 331 pp., illust. $4.60. W. B. Saunders, Philadelphia; McAinsh & Co., Toronto, 1942.

There is undoubted need for such a work as this. With the progress of the war it was soon found, as one would expect, that a great number of medical men were enlisting in the Army, Navy, and Air Force, many of whom had no great amount of experience in connection with the various specialties. Consequently, these men were likely to find themselves wanting when confronted with emergencies under the insistent conditions of warfare. The volume under review was not designed to do more than provide such with the salient features of the general topics concerned. It is in no sense a textbook and will be of little practical use to the experienced specialist. It will be of great value in its restricted field, and, within its scope, is worthy of the highest commendation.